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Home at Airbus

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Abstract: Airbus Commercial aircraft, known as Airbus, is a European aeronautics manufacturer with headquarters in Blagnac, in the suburbs of Toulouse, France. The company, which is 100% -owned by the industrial group of the same name, manufactures more than half of the airliners produced in the world and is Boeing's main competitor. Airbus was founded as a consortium by European manufacturers in the late 1960s. Airbus Industry became a SAS (simplified joint-stock company) in 2001, a subsidiary of EADS renamed Airbus Group in 2014 and Airbus in 2017. BAE Systems 20% of Airbus between 2001 and 2006. In 2010, 62,751 people are employed at 18 Airbus sites in France, Germany, the United Kingdom, Belgium (SABCA) and Spain. Even if parts of Airbus aircraft are essentially made in Europe some come from all over the world. But the final assembly lines are in Toulouse (France), Hamburg (Germany), Seville (Spain), Tianjin (China) and Mobile (United States). Airbus subsidiaries are also located in the United States, China, Japan and India. Airbus produced its first aircraft, the A300, in 1972 and offers a range of commercial aircraft ranging from the A318 to the A380, as well as aircraft and aircraft for business men and women. Airbus was the first manufacturer to install an electric flight control system on the A320. In 2013, Airbus produced 626 aircraft and won 1,503 net orders. This is the best commercial result in the history of aeronautics. At the beginning of 2017, Airbus announced that it had broken its own record of deliveries with the production of 688 aircraft this year, thus becoming No. 1.

Keywords: Aviation, Airbus Commercial Aircraft, Airbus, Airbus Group, Airbus Industry, European Aeronautics Manufacturer, The Flight, Spacecraft Propulsion, Jet Engines

Introduction

Airbus Commercial aircraft, known as Airbus, is a European aeronautics manufacturer with headquarters in Blagnac, in the suburbs of Toulouse, France. The company, which is 100% -owned by t he industrial group of the same name, manufactures more than half of the airliners produced in the world and is Boeing's main competitor (Ville, 2006; Norris, 2010; Airbus).

Airbus was founded as a consortium by European manufacturers in the late 1960s. Airbus Industry became a SAS (simplified joint-stock company) in 2001, a subsidiary of EADS renamed Airbus Group in 2014 and Airbus in 2017. BAE Systems 20% of Airbus between 2001 and 2006 (Gunston, 2010; Laming, 2000). In 2010, 62,751 people are employed at 18 Airbus sites in France, Germany, the United Kingdom, Belgium (SABCA) and Spain. Even if parts of Airbus aircraft are essentially made in Europe some come from all over the world. But the final assembly lines are in Toulouse (France), Hamburg (Germany), Seville (Spain), Tianjin (China) and Mobile (United States). Airbus subsidiaries are also located in the United States, China, Japan and India (Airbus, From Wikipedia).

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the A320. In 2013, Airbus produced 626 aircraft and won 1,503 net orders. This is the best commercial result in the history of aeronautics. At the beginning of 2017, Airbus announced that it had broken its own record of deliveries with the production of 688 aircraft this year, thus becoming No. 1 (Petrescu and Petrescu, 2011; 2012; 2013a; 2013b; 2013c; Airbus, From Wikipedia; Aviation week).

Airbus History

In the aftermath of the Second World War, the global aerospace industry was dominated by the United States. Douglas, Boeing and Lockheed benefited from the important US war effort between 1939 and 1945 and built a large number of four-engine military piston aircraft whose commercial civilian versions (DC-6, Boeing 377, Constellation, etc. a great commercial success). The arrival of jet engines marks the beginning of the era of jet aircraft and the newer aircraft (DC-8, Boeing 707, Boeing 720) dominate the air market. In Europe, the infrastructures of the aeronautical industry were partly destroyed during the war, but the production quickly resumed and the first aircraft equipped with turbojets (Caravelle de Sud-Aviation, Hawker-Siddeley Trident, Vickers VC10, BAC 1-11 of British Aircraft Corporation, etc.) emerged in the 1950s. They did not meet the same success as their American competitors, sold much less and failed to penetrate the US market.

In the 1960s, mass air transport was booming and an FAA study forecast a tripling of traffic between 1965 and 1971 for a market of 1,610 aircraft. At the Paris Air Show in 1965, the main European airlines held informal discussions on their short- and mediumhaul needs, which were necessary to respond to the growth in traffic. The American manufacturers are engaged in the construction of wide-body aircraft (Lockheed L-1011, Boeing 747, etc.), whereas in order to avoid frontal competition, Europeans are interested in a different market, short sea haul Two hundred places, more suited to the short but dense links encountered in Europe and seek to develop the idea of "airbuses".

Meetings between the main players in air transport take place and European manufacturers all follow their own projects: Galion for South Aviation, successor to BAC 1-11 for British Aircraft Corporation, an extended version of the Trident for Hawker-Siddeley, Etc. Hawker-Siddeley is also conducting studies with Nord-Aviation and Breguet on a new widebody aircraft, the "HBN 100" (initials of Hawker, Breguet and Nord), a 20-foot-diameter circular fuselage similar to 747 of Boeing. German industrialists, seeing a chance to restart their national industrial production, also launched a study group of 5 manufacturers (Dornier, Hamburger Flugzeugbau,

Messerschmitt-Bölkow, Siebelwerke-ATG and VFW). The Studiengruppe Airbus, using the name "Airbus" officially, is studying the possibility of participating in an international collaboration, but none of these projects compete with American aircraft. British European Airways then brought together eight European airlines in October 1965 at a symposium devoted to the "Airbus" market. The result is a Franco-British project of 200 to 225 passengers with an autonomy of 810 nautical miles, at a cost price of 20 to 30% less than the 727-200.

In 1965, the Germans transformed their study group into a more organized and coordinated structure, the Arbeitsgemeinschaft Airbus, which aims at the development of a four-engine wide-body aircraft in collaboration with other European partners. At the beginning of 1966, Sud-Aviation and Dassault were also discussing a proposed twin-jet twin-jet aircraft that competed with the HBN-100. Faced with this renewed interest, the German, British and French governments agree to designate a single national company to represent them (Arbeitsgemeinschaft Airbus for Germany, Hawker-Siddeley for the United Kingdom and South-Aviation for France). The HBN-100 project is officially selected and a request for funding is made to the three governments on 15 October 1966. For the first project, the project is presented under the name "Airbus A300".

In early 1967, the size of the A300 was significantly upgraded, partly for prestige issues, although no European airline saw the need for such capacity in the immediate future. The French and the British agreed to assign the management of the studies to France, on the condition that Rolls-Royce is the supplier of the engines. In May 1967 a more elaborate project with a capacity of 300 passengers was presented and the cost of research and development was estimated at 190 million pounds, 37.5% of which was paid for by the United Kingdom, 37, 5% by France and 25% by Germany. Estimates predict a potential market of 250 aircraft and on July 25, 1967, the draft agreement is formally signed in order to "strengthen European cooperation in the field of aerospace technology". A memorandum of understanding on the launching of the first phase of the A300 study was signed in London in September 1967. It provided that the final plans were to be finalized in June 1968 and that the prototype being built only on condition that orders reach 75 copies.

In the months following the signing, the French and British governments expressed doubts about the feasibility of the project. The airlines are squandering the A300 which they consider too large and the consortium does not register any orders in June 1968. French and British are worried about the increase in the cost of the program. France has to finance two major projects in parallel (Concorde and Dassault Mercure 100), but in the A300 it is possible to provide 30,000 employees, mostly French, while the United Kingdom, already worried by the Concorde's development costs, is increasingly expressing doubts about its participation. In addition, with Rolls-Royce and Lockheed having signed an exclusive agreement for the RB211 engine to equip the A300, the UK is under the obligation to finance the development of a new, more powerful turbojet engine. Taking this information in 1968, Roger Béteille decided to have the project adapted to the reactors available. As a result, a solution was proposed as the "A250" according to

the number of seats but immediately renamed "A300B" having dimensions slightly lower than the initial A300 and weighing 25 tons less. Its bunker was redesigned to enable it to embark LD3 containers side by side and increase its economic profitability. Tony Benn, British Minister of Technology, announced in December 1968 that the United Kingdom could not commit itself to financial participation in the project and might not support the consortium. The United Kingdom finally decided to abandon its participation in the project in 1969.

Faced with this withdrawal, West Germany, pushed by its Finance Minister Franz Josef Strauß sees a chance to rebuild its civil aeronautics industry and proposes to increase its participation in the project and to increase its funding to 50%. France and Germany signed a cooperation agreement for the 226-seat "A300B" jet at the Paris Air Show in 1969, designed to be more economical than competing tri or quadriactors. General Electric is working with Snecma to develop the future CFM 56 engine. Despite the UK's withdrawal, Hawker-Siddeley's director Arnold Hall had already invested 35 million pounds in the design and Manufacturing of the wings and decided to associate alone with Sud-Aviation and Deutsche Airbus on the A300B project.

On January 1, 1970, South and North-Aviation joined forces to form a giant in aeronautics: Aerospace. French and Germans wish to formalize the structure of their collaboration and the financing of the A300B. Originally allocated to 50% for each country, the shares must be changed. Several of Deutsche Airbus' partners decided to withdraw from the project, leaving only MBB and VFW-Fokker. But since VFW-Fokker is only the German part of the Fokker-VFW group based in the Netherlands, the Dutch government is obliged to take 6.6% of the shares of the A300B project in order to regularize the situation. The share of France and Germany is now only 46.7%. After this restructuring, Aerospatiale and Deutsche Airbus formally form "Airbus Industry" on 18 December 1970. The structure of Airbus Industry is that of an Economic Interest Grouping (GIE) which facilitates exchanges between the participating nations and offers more Flexibility in operations. The headquarters of the new entity is based in Paris and Franz-Josef Strauss is appointed Chairman of the Supervisory Board, responsible for deciding on new programs (Airbus, From Wikipedia; Aversa *et al*., 2016a; 2016b; 2016c; 2016d; 2016e; 2016f; 2016g; 2016h; 2016i; 2016j; 2016k; 2016l; 2016m; 2016n; 2016o; 2017a; 2017b; 2017c; 2017d; 2017e; Mirsayar *et al*., 2017).

After the transfer of shares from Fokker to West Germany, the Spanish manufacturer Construcciones Aeronáuticas Sociedad Anónima (CASA), which had been associated with the Dassault Mercure program since 1969, joins Airbus Industry and takes 4.2% of the capital, reducing the share of Aerospatiale and Deutsche Airbus to 47.9% each.

As soon as the prototype was built, Felix Kracht planned to build variants of the A300B with additional carrying capacity and operating radius to make it flexible and adaptable to all segments of the market.

The capacity of the A300B1 is not large enough for Air France, which is more interested in the extended version A300B2, with a capacity of 270 passengers and places an order of 6 copies of this version on 3 September 1970, the very first Airbus order. The first flight of the A300B1 was carried out on 28 October 1972 one month ahead of schedule and it was certified by the French DGAC and the German LBA on 15 March 1974 and by the FAA on 30 May 1974. Air France was the first company to operate the first commercial flight of the A300 between Paris and London on 15 April 1974 (Airbus; Gunston, 2010; Laming, 2000).

In order to publicize the A300 and try to penetrate the American market, Airbus decided in September 1973 to launch a six-week exhibition tour in North and South America, as the manufacturer had been considering the US market since its founding. While this tour was a great success, the sale of the A300 was still difficult. In fact, between the end of 1975 and May 1977, no firm order was signed.

The first contract on the other side of the Atlantic was signed by Western Airlines with eight A300B4s to replace its old B707 and B720s in January 1977. Nevertheless, Airbus now has a strong protectionism in the United States that has ruined Western's contract (Airbus, From Wikipedia).

It was Frank Borman, director of Eastern Air Lines and former astronaut, who saved the A300 program, by ordering 23 A300B4s on April 6, 1978 and launched Airbus's career in the United States. Indeed, Airbus had offered him a free rental of four new aircraft for six months, so that the company could know the reliability and profitability of the A300. EAL needed only crew training and operating costs. It took only three months in favor of CEO Borman's conclusion. As soon as the acquisition was denounced, Borman was condemned by several administrative officers as well as the CEO of Douglas. If Airbus had not selected the General Electric reactor, EAL could not resist their attacks. This man, distinguished from his career with the army and astronautics, succeeded in defending his contract with Airbus, highlighting a large number of American suppliers participating in the program of the A300, especially those of the engine (Airbus, From Wikipedia; Ville, 2006; Norris, 2010).

If the A300 program was saved, it was technically and politically thanks to the General Electric CF6 reactor, originally developed for the DC-10. In addition, when the Airbus was commissioned in 1971, before the A300 began commercial flights, it had a good reliability, which enabled Airbus to convince Eastern Airlines in 1978. G-SWJW, A300B4-203 MSN302 s 'Equipping the CF6-50C2 (Fig. 1).

The General Electric CF6 is a family of highbypass turbofan engines produced by GE Aviation. Based on the TF39, the first high-power high-bypass jet engine, the CF6 powers a wide variety of civilian airliners.

The basic engine core also powers the LM2500, LM5000 and LM6000 marine and power generation turbo shafts.

After developing the TF39 for the C-5 Galaxy in the late 1960s, GE offered a more powerful variant for civilian use, the CF6 and quickly found interest in two designs being offered for a recent Eastern Airlines contract, the Lockheed L-1011 and McDonnell Douglas DC-10.

The Lockheed eventually selected the Rolls-Royce RB211, but Douglas stuck with the CF6 and the DC-10 entered service in 1971.

It was also selected for versions of the Boeing 747. Since then, the CF6 has powered versions of the Airbus A300, A310 and A330, Boeing 767 and McDonnell Douglas MD-11 (General Electric CF6, From Wikipedia).

For the CF6-80C2-A1, the fan diameter is increased to 93 in (2.36 m), with an airflow of 1750 lb/s (790 kg/s).

Overall pressure ratio is 30.4, with a bypass ratio of 5.15. Static thrust is 59,000 lb (263 kN). An extra stage is added to the HP compressor and a 5th to the LP turbine.

The CF6-80C2 is currently certified on eleven wide body aircraft models including the Boeing 747-400 and McDonnell Douglas MD-11 (Airbus, From Wikipedia).

The CF6-80C2 is also certified for ETOPS-180 for the Airbus A300, Airbus A310, Boeing 767 and, Kawasaki C-2(CF6-80C2K), as the F138-GE-100, the U.S. Air Force's C-5M Super Galaxy. A CF6-80C2K1F variant Engine for the Kawasaki C-2 can be seen in the Fig. 2 (General Electric CF6, From Wikipedia).

Airbus A300, the first aircraft launched by Airbus, introduced in 1974 (Fig. 3).

The Airbus A300 was to be the first aircraft to be developed, manufactured and marketed by Airbus.

By early 1967 the "A300" label began to be applied to a proposed 320 seat, twin engined airliner. Following the 1967 tri-government agreement, Roger Béteille was appointed technical director of the A300 development project.

While the A300 met with great commercial success against Boeing, Airbus decided to launch in July 1978 the development of a successor.

The capacity of the A300 had largely been decided in order to satisfy the needs of the Air France company but had given birth to a device a little too big for the real needs and many companies did not have enough traffic to fill Of the A300s.

To reduce the cost of research and development, Airbus plans to design the A300B10MC (A300B Minimum Change) by shortening the fuselage of an A300B in order to obtain a capacity of 220 passengers but such a device would have the disadvantage of Having an oversized and too heavy wing and landing gear, leading to an overconsumption of kerosene.

Numerous sessions of consultation between the different partners follow each other and make it possible to refine the characteristics of the future A310.

Unlike the A300, largely influenced by the political decisions of the participating countries, technical and commercial considerations predominated during the development of the A310 project and marked for the first time the emergence of a genuine Airbus industrial power against the member states.

The first model of the A310 was presented at the Hanover Air Show in April 1978 and the A300B10 was launched on 6 July 1978 by Aerospatiale, MBB, Fokker and CASA. At the beginning of 1979, Lufthansa, Swissair, KLM, Air France and Iberia have already ordered numerous copies of the A310, whose plans are becoming more and more precise.

The design effort of the A310 allows the UK and British Aerospace (BAe) to regain a role in the European aeronautics industry as new wings have to be created for the A310. BAe is a national conglomerate that emerged from the consolidation movement of the British aerospace industry launched by the Labor government in the 1970s and the British government asks whether BAe should get closer to Airbus or an American manufacturer. British Airways, the majority of which are American aircraft and Rolls-Royce Lld, whose RB211 engine equips the Boeing 757, are in favor of an alliance with the Americans, but Hawker-Siddeley's involvement in the A300 program With Airbus and an agreement was signed between Airbus and BAe on 27 October 1978. The French, German, Spanish and British Governments ratified this agreement on 27 October 1978 and BAe officially joined the EIG on 1 January 1979 to participate in the development and Construction of the A310.

The participation of the consortium member states is as follows: 37,9% for the Germans and the French, 20% for the British and 4,2% for the Spaniards.

The prototype of the A310 made its first test flight on 3 April 1982 and the first aircraft fitted with the General Electric CF6-80A3 and Pratt and Whitney JT9D-7R4D1 were simultaneously delivered to Lufthansa and Swissair on 29 March 1983 with a major ceremony organized by Airbus, following their previous legal deliveries. Both were certified on March 11th.

Many technological innovations are emerging on the A310.

The airbrakes, spoilers and steering are made of carbon fiber reinforced plastic, first tested on the A300 (5%) and then included in series on the A310-200 (7%). It is also the first device to have a supercritical wing. Faced with the demand of airlines for aircraft offering increased range, Airbus proposed in 1982 a new version of the A310 with a range of 7,500 km, the A310-300. For the first time, the main structures such as the vertical stabilizer are made of composite materials.

The addition of winglets reduces the drag induced by the lift and reduces the consumption of kerosene. Although the A310 offers many technological innovations, it has met with mixed commercial success with only 255 deliveries in late 2000 against over 817 for its main competitor, the Boeing 767 (Gunston, 2010; Laming, 2000; General Electric CF6, From Wikipedia).

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Fig. 1. If the A300 program was saved, it was technically and politically thanks to the General Electric CF6 reactor Source: https://en.wikipedia.org/wiki/General_Electric_CF6#/media /File:Turbofan640.jpg

Fig. 2. A CF6-80C2K1F variant Engine for the Kawasaki Source: https://en.wikipedia.org/wiki/General_Electric_CF6#/media/File:General_Electric_CF6-80C2K1F_Engine_at_JASDF_Gifu_Air_Base_October_30, _2016_(cropped).jpg

Fig. 3. Airbus A300, the first aircraft launched by Airbus, introduced in 1974 Source: https://en.wikipedia.org/wiki/Airbus#/media/File:Airbus_A300_B2_Zero-G.jpg

The recession of the early 1980s led to lower orders and the shutdown of production of the A300B in 1984. A modernized version of the A300, the A300-600, is proposed and incorporates the main features of the A300B, A300 but incorporating the technological innovations of the A310: Removal of the flight engineer and cockpit with only two pilots. Taking advantage of the A310 empennage, more seats were added, while the maximum take-off weight was increased to 165 tons (A300B4-600) and more than 170.5 tons (A300B4-600R). The A300-600 is more successful than the A310 and is available in freight and Super Transporter versions.

While the Germans have achieved the A310, market research shows that the medium-haul segment of 150 seats is becoming more and more popular with companies and would compete with the Boeing 737-200 and DC- 9 of MacDonnell Douglas. The first studies for such a device date back to the mid-1970s when a committee composed of Aerospatiale, BAC, Hawker-Siddeley, Dornier, MBB and VFW met in 1974 to discuss several aircraft proposals. Dassault proposes the Mercure 2000, BAC offers the X-Eleven and Aerospace offers the A200 in two versions: the A200A with 134 seats and the A200B with 174 seats.

In 1981, the Airbus Industry Supervisory Board authorized the GIE to initiate talks with companies and engine manufacturers for a 150-seat aircraft and in June 1981 Bernard Lathière announced that the A320 program was officially launched. Studies show that the A320 market could reach 3,000 units over 10 years. At the Paris Air Show, Air France is giving an extra boost to this program by declaring its intention to acquire 25 aircraft with an option on 25 others, even before the program is officially launched. The new Airbus aircraft had to be similar in size to the B737 but had to offer different carrying capacities. After the oil shock of 1970, Airbus wished to minimize the consumption of its A320s

and to differentiate itself from the competition by introducing decisive and numerous technological innovations, such as electric flight controls, composite materials structures, The center of gravity by displacement of the kerosene, the dashboard all screen and a cockpit with only two pilots. These innovations have allowed the A320 to consume half as much kerosene as the Boeing 737 and to provide substantial savings due to double driving.

When the A320 was officially launched on 2 March 1984, firm orders already reached the figure of 80 from five different companies. In 1988, Airbus released the A320, the first civil aircraft with electric flight controls, fully controlled by computers. Very controversial initially, this technology was developed thanks to the accumulated experience on Concorde. The A320 is the first aircraft of its class (narrow body or single aisle, i.e., narrow body or a single corridor of about 150 seats) designed after the Boeing 737 which dates back to the 1960s. Airbus A 320, was the first model in the A318, A319, A320 and A321 family, introduced in 1988 (Fig. 4).

The success of the A320 was even clearer when Airbus, in competition with Boeing, won a major order from the American company Pan Am. The first A320 was presented to the public in Toulouse during a sumptuous ceremony in February 1987 and the first aircraft was delivered in March 1988 and then put into service by Air France on 18 April 1988. The Habsheim Crash on 26 June 1988 was the source of controversy over the "And more particularly on embedded computing.

F-GGEA, A320-111 MSN010, first copy delivered to Air Inter.

Piloting for two was the origin of a major strike at Air Inter on the part of the sailors. But this strike was declared illegal by the court of Bobigny in November 1987 and the success of Airbus does not cease.

It was the launch of the A320 that established Airbus as a major player in the aeronautics market, with more than 400 orders before its first flight, compared to only 15 orders for the A300 in 1972. The A320 played a role The Airbus boom: it allowed Airbus, after the success of the A300 and the A310, to become a major player on the world stage and opened a new era in European and global aeronautics. In 2005, the A320 accounted for more than three quarters of Airbus orders.

Following the success of the A320, in November 1989 Airbus launched a project for an extended 186-seat version of the A321.

During the 1990s, Airbus' range of aircraft expanded with the parallel launch of A330/A340 long-haul aircraft and the A320 family's expansion with the A318, A319 and A321.

After the success of the A320 medium-haul aircraft, Airbus tackled the long-haul market in 1987. The first studies led Airbus to take over two former projects already developed in the 1970s: the TA9 and the TA11. The TA9 (TA for Twin-aisle) takes the A300/310 fuselage section, but with a much larger wing designed to compete with the new Boeing 767 with a range of more than 10,000 km. Airbus also took over the A300-B11 project, the name of the four engine variant of the A300 that had been studied since the creation of Airbus in 1970. The financing of this project was only assured when British Aerospace joined the consortium in 1979. The project was renamed TA11 (twin-aisle TA), with the objective of tackling the long-haul wide-ship market dominated by the McDonnell Douglas DC-10.

The TA9 program is renamed A330 and the TA11 program is renamed A340 and in order to reduce costs, the development of the A330 and A340 is conducted in parallel and the two devices share many common technology elements. The cabin is identical, the flight controls and the cockpit are taken from the A320 program. In addition to simplifying development studies and manufacturing, this allows airlines to train pilots on only one type of aircraft.

On June 5, 1987, at the Paris Air Show, the A330/A340 program was officially unveiled by Jean Pierson, then head of Airbus, with Lufthansa's first letter of intent to acquire fifteen A340s. On December 14, 1989, Air Inter became the first A330 customer and ordered fourteen aircraft, with an additional fourteen options. The first A340 was commissioned on March 15, 1993, from Frankfurt to New York, replacing the DC-10-30. His twin A330 made the first commercial flight in the colors of Air Inter on January 17, 1994, from Paris Orly to Marseille.

Faced with the success of the A320, Airbus launched in 1987 the idea of an enlarged derivative version and the initial plans were oriented towards an aircraft with an elongated fuselage but with an identical concept and general structure. This reinforces the principle of the A320 family but also limits research and development studies as Airbus' engineering teams are mainly involved in the A330/A340 program. The program, costing $840 million, is for the first time not financed by public funds but by the issuance of bonds. The first plans for an aircraft with a capacity of 180 to 220 passengers were presented in April 1988 and the first flight took place in March 1993. Airbus A340 was introduced in 1993 (Fig. 5).

Airbus A330 was introduced in 1994 (Fig. 6).

While the global economy is recovering rapidly from the recession of the early 1990s, aircraft orders are on the rise again. The main aeronautical manufacturers must increase their production rates in order to satisfy the demand of the client companies but the structure of the

Airbus consortium represents a brake on this development and this increase in power. The management of Airbus is complicated because it is shared in four countries and leads to high labor costs, a very long decision-making time, redundancies in the research effort and national rivalries. In addition, each of the national companies is responsible for its investments and the management of its workforce and Airbus Industry has no control over the overall management of the consortium. The dispersion of Airbus resources on different sites makes it difficult to communicate with the client companies, who have always been involved in the development of new aircraft. This particularity becomes an increasingly major problem as Airbus embarks on financing the design and development of the A3XX project.

In order to simplify the structure, reduce costs and remain competitive with Boeing, the Airbus Industry Supervisory Board announced its intention to restructure the GIE in order to make it a unified undertaking and discussions began on Assets to be sold by 1999 to the new Airbus entity. Integration into a single company could save a billion dollars a year. In December 1998, British Aerospace and DASA led a talk to merge. Aerospace is blocking any discussion of a possible Airbus restructuring, fearing that the new BAe/DASA group, with 57.9% of Airbus shares, will take over Aerospatiale. Aerospace claims that its share should be increased to 50%. But in January 1999, BAe bought out Marconi Electronic Systems, the defense arm of General Electric Company, to train BAE Systems and abandoned plans to merge with DASA. Faced with the lack of action, the industry ministers of the countries participating in Airbus threaten to withdraw their support if Airbus does not turn into an integrated company. The privatization of Aerospace during its merger with Matra Hautes Technologies to form Aerospace-Matra is a first step.

In 2001, following the consolidation of the European aerospace industry, Aerospace, DASA and CASA merged to form EADS and joined BAE Systems to form the integrated company Airbus, 80% owned by EADS and 20% by BAE. The head office of the new company is located in Toulouse and its first president is Noël Forgeard. In September 2006, EADS bought 20% of Airbus' capital from British Aerospace. At the end of January 2007, the weekly "Capital" announced that Russia was negotiating a 20% stake in the European manufacturer, via a Russian bank or a Russian state-owned company (see Vnechtorgbank and OAK).

The A380 (Fig. 7) is the result of a project that dates back to the 1980s when Airbus plans to tackle the very large aircraft market and break the Boeing 747 monopoly (Aviation week). The first sketches of an aircraft capable of carrying more than 800 passengers were carried out in 1988 but Airbus did not officially launch its project until the end of 1995 and baptized it Airbus A3XX. After having contacted many interested airlines and when the national producers Aerospace-Matra, DASA and CASA merged to form EADS, the Airbus Supervisory Board officially launched the A3XX program on 19 December 2000 and renamed it A380 That 55 aircraft have already been ordered by six companies. The configuration of the A380 was definitively fixed at the beginning of 2001 and the manufacture of the first elements of the wing box began on 23 January 2002. The official presentation of the A380 took place on 18 January 2005 and The first flight took place on 27 April 2005. Five A380s were built for the two-year test phase, after which two versions of the aircraft (A380-841 and A380-842) were certified by EASA and the FAA on 12 December 2006 and 14 December 2007 (Gunston, 2010; Laming, 2000).

The A380 program, however, encounters many problems of industrialization and its commercial launch is postponed three times. The cabling of the passenger cabin in Hamburg is the main difficulty because some cables are too short to be connected to the other parts of the aircraft during the final assembly in Toulouse. Airbus attributed these problems to the complexity of such a system and to factors specific to the A380, including the customization of the interior design of aircraft according to the companies. The lack of integration of Airbus has also been questioned because the German and French Airbus factories use different versions of the same CATIA software, version 4 for Germany and Spain and version 5 for the United Kingdom and La France. Moreover, the 3D digital models supposed to facilitate the integration of electrical harnesses were only realized very late in the program and the different teams were still in the learning phase. Airbus announced a first delay of 6 months in 2005 and a second of 6 to 7 months in June 2006 as well as a significant drop in the production rate. This announcement resulted in a 26% fall in the EADS share and led to the departure of Noël Forgeard, Gustav Humbert and Charles Champion. In October 2006, EADS announced a third one-year delay, the postponement of the delivery of the first A380 to October 2007 and a decline in annual production forecasts.

The 18-month delay has many financial consequences for Airbus, resulting in an extra cost of 4.8 billion Euros and raising the A380's break-even point from 250 aircraft at the launch of the program to 270 in 2001, Then 300 in March 2006 and finally 420 in October 2006. The shortfall over the period 2006-2010 is estimated at 6.3 billion Euros. Many companies, aggrieved by delays, require financial compensation. Thus, Emirates received $110 million in compensation.

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Fig. 4. Airbus A320, the first model in the A318, A319, A320 and A321 family, introduced in 1988 Source: https://en.wikipedia.org/wiki/Airbus#/media/File:Swiss.a320-200.hb-ijq.arp.jpg

Fig. 5. Airbus A340 introduced in 1993 Source:https://en.wikipedia.org/wiki/Airbus#/media/File:Airbus_A340-311,_Lufthansa_AN1936774.jpg

Fig. 6. Airbus A330 introduced in 1994 Source: https://en.wikipedia.org/wiki/Airbus#/media/File:Nwa_a330-300_n805nw_arp.jpg

Boeing has been the dominant aeronautic manufacturer since its inception in the early 20th century. Since the withdrawal of Lockheed from the civilian industry in 1986 and the takeover of McDonnell Douglas by Boeing in 1997, the market for passenger aircraft with more than one hundred seats is in a duopoly situation with two major manufacturers, Airbus and Boeing.

Fig. 7. April 27, 2005 at 10:30 am: first test flight, MSN001 in Toulouse Source: https://en.wikipedia.org/wiki/Airbus#/media/File:Airbus_A380.jpg

Today, Airbus and Boeing are in front-line competition for aircraft orders. Although the two manufacturers offer a wide range of aircraft, ranging from single-aisle to large-bodied, these aircraft do not always occupy exactly the same segment. Airbus and Boeing offer versions of capacity or range greater or lesser than the competitor in order to satisfy needs for which there is not yet a device. The A380 has a larger capacity than the 747, the A350 fills the segment between the 787 and the 777, the A320 is larger than the 737-700 but smaller than the 737-800, the A321 is Bigger than the 737-900 but smaller than the 757, to the biggest benefit of airlines who are offered a continuous range of aircraft ranging from 100 to 500 passengers.

Home at Airbus

The main Airbus factory in Toulouse is located next to Toulouse-Blagnac Airport (Fig. 8), (Petrescu and Petrescu, 2012).

Later Development

In the late 1990s Airbus became increasingly interested in developing and selling to the military aviation market. Expansion in the military aircraft market is desirable as it reduces Airbus' exposure to downturns in the civil aviation industry. It embarked on two main fields of development: aerial refuelling with the Airbus A310 MRTT and the Airbus A330 MRTT and tactical airlift with the A400M. In January 1999 Airbus established a separate company, Airbus Military SAS, to undertake development and production of a turboprop-powered tactical transport aircraft, the Airbus Military A400M (Fig. 9), (Petrescu and Petrescu, 2012).

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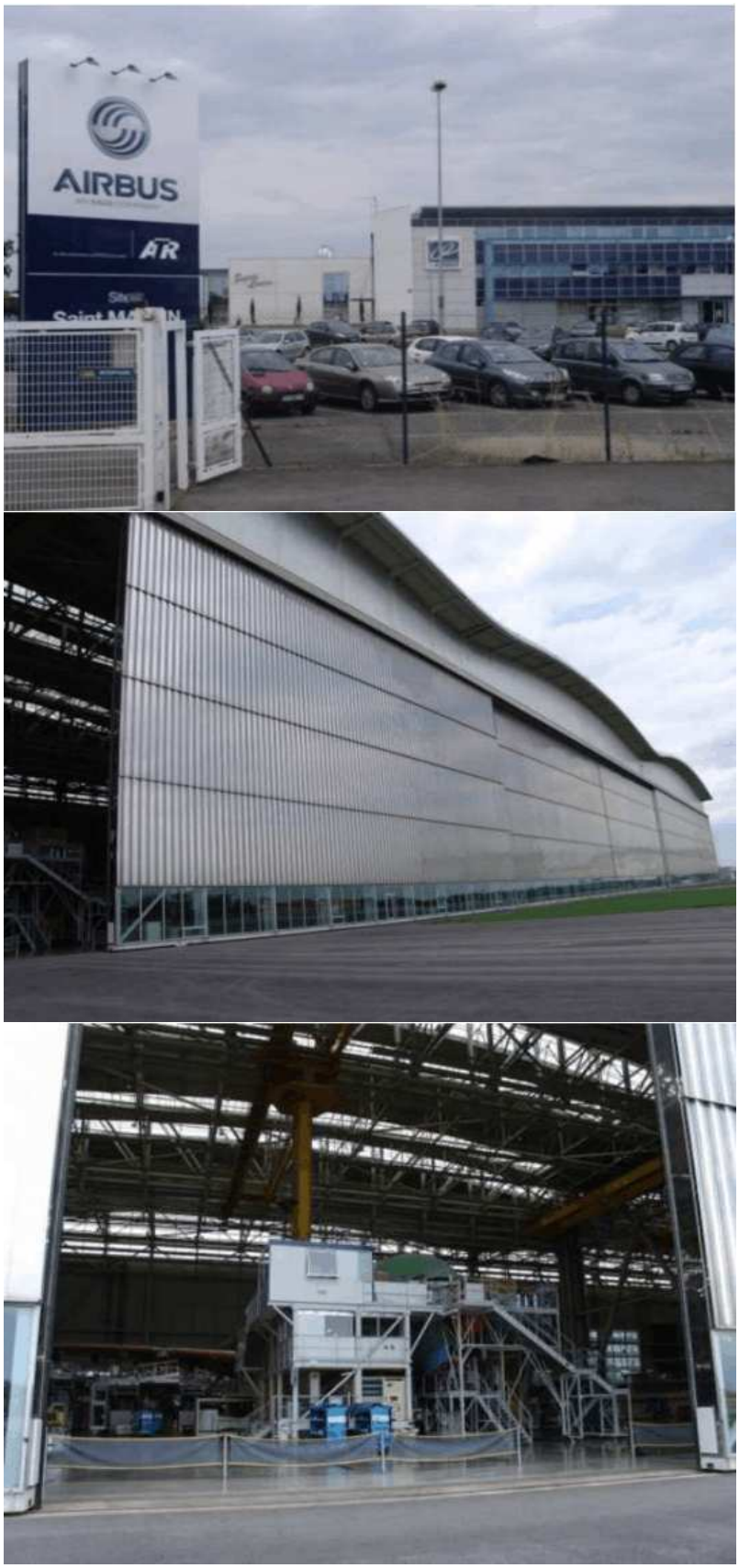

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Fig. 8. Home at airbus source: (Petrescu and Petrescu, 2012)

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Fig. 9. Airbus military A400M Source: https://en.wikipedia.org/wiki/Airbus_A400M_Atlas#/media/File:Airbus_A400M_Atlas_(9421077417).jpg

Results

In the 1980s, when Airbus became a serious competitor and succeeded in penetrating the US market, the United States blamed Europeans for financing the design and development of Airbus through government subsidies. The European Union is also concerned about subsidies received by US manufacturers via NASA programs and defense programs and negotiations between the US and Europe to restrict funding from government funds lead to the signing in 1992 of a 'An "EU-US Large Civil Aircraft Agreement", which sets the framework for public subsidies and imposes much stricter rules and limits on both parties than the World Trade Organization (WTO). Direct financing for a new project are limited to 33% of the total development cost, must be granted at an interest rate that can't be lower than the cost of the credit for the State and must be repaid within a of 17 years. Indirect aid is limited to 3% of the turnover of the national civil aviation of large aircraft196.

In 1997, the Americans refused a European proposal to renegotiate the 1992 treaty, but in 2004 the United States and the European Union agreed to discuss a possible revision of the agreement to include all forms of public funding. In August 2004, when Boeing suffered the consequences of the September 11 attacks and had just dismissed 40,000 employees, George W. Bush, in the midst of a campaign for the November 2004 presidential election, announced during a speech against workers of Boeing, that he asked Robert Zoellick, the US Trade Representative, to tell Europe that Americans consider illegal subsidies and that he should do everything possible to stop them, including by filing a complaint with the US WTO1. In October 2004, Harry Stonecipher, President of Boeing, actually filed a complaint1 and asked the WTO to investigate European funding since the launch of Airbus1. Boeing estimates this aid to be $40 billion since 1969 and the United States withdraws unilaterally from the 1992-1999 agreement.

In response, Airbus also lodged a complaint with the WTO and denounced the illegal subsidies of Boeing 200. Airbus accuses Boeing of having received $18 billion in direct or indirect illegal financing through US government tax deductions and tax relief in the states of Kansas, Illinois and Washington where they are based Boeing assembly lines, as well as disguised subsidies in the form of contracts awarded by the Department of Defense, NASA research and development contracts with significant civilian spinoffs and funding from Japanese airlines for the program of the Boeing 7E7 (later Boeing 787). Airbus adds that Boeing's complaint is motivated by domest ic policy issues, a few months before the US presidential election. On 11 January 2005, Boeing and Airbus agreed to try to find a solution to the dispute outside the WTO, but in June 2005, following the launch of the design program for the A350, Boeing And the US government reopened the trade dispute with the WTO, claiming that Airbus was going to receive new illegal subsidies for the A350 and A380. Airbus is turning back against Boeing, accusing it of receiving subsidies for the development of the 787.

After five years of proceedings, the WTO makes several judgments following the various complaints. The WTO declared on 24 March 2010 that Airbus received illegal aid. In September 2010 a WTO preliminary report stated that the subsidies granted to Boeing had violated WTO rules and had to be withdrawn, but Boeing replied that the judgment was only a fraction of what Boeing accused of Airbus. In two separate rulings issued in May 2011, the WTO found that funding from the Ministry of Defense and NASA could not be used to finance civil aeronautical projects and that Boeing owed $5.3 billion in illegal subsidies. The WTO Appellate Body, on the other hand, breaks the previous WTO ruling in September 2010 and found that the aid provided by Europe was illegal. The new ruling establishes that such funding is not intended to stimulate exports and that public private partnerships may continue, but part of the $18 billion is to be repaid.

Discussion

Airbus Commercial aircraft, known as Airbus, is a European aeronautics manufacturer with headquarters in Blagnac, in the suburbs of Toulouse, France. The company, which is 100% -owned by the industrial group of the same name, manufactures more than half of the airliners produced in the world and is Boeing's main competitor. Airbus was founded as a consortium by European manufacturers in the late 1960s. Airbus Industry became a SAS (simplified joint-stock company) in 2001, a subsidiary of EADS renamed Airbus Group in 2014 and Airbus in 2017. BAE Systems 20% of Airbus between 2001 and 2006. In 2010, 62,751 people are employed at 18 Airbus sites in France, Germany, the United Kingdom, Belgium (SABCA) and Spain. Even if parts of Airbus aircraft are essentially made in Europe some come from all over the world. But the final assembly lines are in Toulouse (France), Hamburg (Germany), Seville (Spain), Tianjin (China) and Mobile (United States). Airbus subsidiaries are also located in the United States, China, Japan and India. Airbus produced its first aircraft, the A300, in 1972 and offers a range of commercial aircraft ranging from the A318 to the A380, as well as aircraft and aircraft for business men and women. Airbus was the first manufacturer to install an electric flight control system on the A320. In 2013, Airbus produced 626 aircraft and won 1,503 net orders. This is the best commercial result in the history of aeronautics. At the beginning of 2017, Airbus announced that it had broken its own record of deliveries with the production of 688 aircraft this year, thus becoming No. 1.

In the aftermath of the Second World War, the global aerospace industry was dominated by the United States. Douglas, Boeing and Lockheed benefited from the important US war effort between 1939 and 1945 and built a large number of four -engine military piston aircraft whose commercial civilian versions (DC-6, Boeing 377, Constellation, etc. a great commercial success). The arrival of jet engines marks the beginning of the era of jet aircraft and the newer aircraft (DC-8, Boeing 707, Boeing 720) dominate the air market. In Europe, the infrastructures of the aeronautical industry were partly destroyed during the war, but the production quickly resumed and the first aircraft equipped with turbojets (Caravelle de Sud-Aviation, Hawker-Siddeley Trident, Vickers VC10, BAC 1 -11 of British Aircraft Corporation, etc.) emerged in the 1950s. They did not meet the same success as their American competitors, sold much less and failed to penetrate the US market.

In the 1960s, mass air transport was booming and an FAA study forecast a tripling of traffic between 1965 and 1971 for a market of 1,610 aircraft. At the Paris Air Show in 1965, the main European airlines held informal discussions on their short- and mediumhaul needs, which were necessary to respond to the growth in traffic. The American manufacturers are engaged in the construction of wide-body aircraft (Lockheed L-1011, Boeing 747, etc.), whereas in order to avoid frontal competition, Europeans are interested in a different market, short sea haul Two hundred places, more suited to the short but dense links encountered in Europe and seek to develop the idea of "airbuses".

Meetings between the main players in air transport take place and European manufacturers all follow their own projects: Galion for South Aviation, successor to BAC 1-11 for British Aircraft Corporation, an extended version of the Trident for Hawker-Siddeley, Etc. Hawker-Siddeley is also conducting studies with Nord-Aviation and Breguet on a new widebody aircraft, the "HBN 100" (initials of Hawker, Breguet and Nord), a 20-foot-diameter circular fuselage similar to 747 of Boeing. German industrialists, seeing a chance to restart their national industrial production, also launched a study group of 5 manufacturers (Dornier, Hamburger Flugzeugbau,

Messerschmitt-Bölkow, Siebelwerke-ATG and VFW). The Studiengruppe Airbus, using the name "Airbus" officially, is studying the possibility of participating in an international collaboration, but none of these projects compete with American aircraft. British European Airways then brought together eight European airlines in October 1965 at a symposium devoted to the "Airbus" market. The result is a Franco-British project of 200 to 225 passengers with an autonomy of 810 nautical miles, at a cost price of 20 to 30% less than the 727-200.

In 1965, the Germans transformed their study group into a more organized and coordinated structure, the Arbeitsgemeinschaft Airbus, which aims at the development of a four-engine wide-body aircraft in collaboration with other European partners. At the beginning of 1966, Sud-Aviation and Dassault were also discussing a proposed twin-jet twin-jet aircraft that competed with the HBN-100. Faced with this renewed interest, the German, British and French governments agree to designate a single national company to represent them (Arbeitsgemeinschaft Airbus for Germany,

Hawker-Siddeley for the United Kingdom and South-Aviation for France). The HBN-100 project is officially selected and a request for funding is made to the three governments on 15 October 1966. For the first project, the project is presented under the name "Airbus A300".

In early 1967, the size of the A300 was significantly upgraded, partly for prestige issues, although no European airline saw the need for such capacity in the immediate future. The French and the British agreed to assign the management of the studies to France, on the condition that Rolls-Royce is the supplier of the engines. In May 1967 a more elaborate project with a capacity of 300 passengers was presented and the cost of research and development was estimated at 190 million pounds, 37.5% of which was paid for by the United Kingdom, 37, 5% by France and 25% by Germany. Estimates predict a potential market of 250 aircraft and on July 25, 1967, the draft agreement is formally signed in order to "strengthen European cooperation in the field of aerospace technology". A memorandum of understanding on the launching of the first phase of the A300 study was signed in London in September 1967. It provided that the final plans were to be finalized in June 1968 and that the prototype being built only on condition that orders reach 75 copies.

In the months following the signing, the French and British governments expressed doubts about the feasibility of the project. The airlines are squandering the A300 which they consider too large and the consortium does not register any orders in June 1968. French and British are worried about the increase in the cost of the program. France has to finance two major projects in parallel (Concorde and Dassault Mercure 100), but in the A300 it is possible to provide 30,000 employees, mostly French, while the United Kingdom, already worried by the Concorde's development costs, is increasingly expressing doubts about its participation. In addition, with Rolls-Royce and Lockheed having signed an exclusive agreement for the RB211 engine to equip the A300, the UK is under the obligation to finance the development of a new, more powerful turbojet engine. Taking this information in 1968, Roger Béteille decided to have the project adapted to the reactors available. As a result, a solution was proposed as the "A250" according to the number of seats but immediately renamed "A300B" having dimensions slightly lower than the initial A300 and weighing 25 tons less. Its bunker was redesigned to enable it to embark LD3 containers side by side and increase its economic profitability. Tony Benn, British Minister of Technology, announced in December 1968 that the United Kingdom could not commit itself to financial participation in the project and might not support the consortium. The United Kingdom finally decided to abandon its participation in the project in 1969.

Faced with this withdrawal, West Germany, pushed by its Finance Minister Franz Josef Strauß sees a chance to rebuild its civil aeronautics industry and proposes to increase its participation in the project and to increase its funding to 50%. France and Germany signed a cooperation agreement for the 226-seat "A300B" jet at the Paris Air Show in 1969, designed to be more economical than competing tri or quadriactors. General Electric is working with Snecma to develop the future CFM 56 engine. Despite the UK's withdrawal, Hawker-Siddeley's director Arnold Hall had already invested 35 million pounds in the design and Manufacturing of the wings and decided to associate alone with Sud-Aviation and Deutsche Airbus on the A300B project.

On January 1, 1970, South and North-Aviation joined forces to form a giant in aeronautics: Aerospace. French and Germans wish to formalize the structure of their collaboration and the financing of the A300B. Originally allocated to 50% for each country, the shares must be changed. Several of Deutsche Airbus' partners decided to withdraw from the project, leaving only MBB and VFW-Fokker. But since VFW-Fokker is only the German part of the Fokker-VFW group based in the Netherlands, the Dutch government is obliged to take 6.6% of the shares of the A300B project in order to regularize the situation. The share of France and Germany is now only 46.7%. After this restructuring, Aerospatiale and Deutsche Airbus formally form "Airbus Industry" on 18 December 1970. The structure of Airbus Industry is that of an Economic Interest Grouping (GIE) which facilitates exchanges between the participating nations and offers more Flexibility in operations. The headquarters of the new entity is based in Paris and Franz-Josef Strauss is appointed Chairman of the Supervisory Board, responsible for deciding on new programs (Airbus, From Wikipedia).

After the transfer of shares from Fokker to West Germany, the Spanish manufacturer Construcciones Aeronáuticas Sociedad Anónima (CASA), which had been associated with the Dassault Mercure program since 1969, joins Airbus Industry and takes 4.2% of the capital, reducing the share of Aerospatiale and Deutsche Airbus to 47.9% each.

As soon as the prototype was built, Felix Kracht planned to build variants of the A300B with additional carrying capacity and operating radius to make it flexible and adaptable to all segments of the market.

The capacity of the A300B1 is not large enough for Air France, which is more interested in the extended version A300B2, with a capacity of 270 passengers and places an order of 6 copies of this version on 3 September 1970, the very first Airbus order. The first flight of the A300B1 was carried out on 28 October 1972 one month ahead of schedule and it was certified by the French DGAC and the German LBA on 15 March 1974 and by the FAA on 30 May 1974. Air France was the first company to operate the first commercial flight of the A300 between Paris and London on 15 April 1974 (Airbus; Gunston, 2010; Laming, 2000).

In order to publicize the A300 and try to penetrate the American market, Airbus decided in September 1973 to launch a six-week exhibition tour in North

and South America, as the manufacturer had been considering the US market since its founding. While this tour was a great success, the sale of the A300 was still difficult. In fact, between the end of 1975 and May 1977, no firm order was signed.

The first contract on the other side of the Atlantic was signed by Western Airlines with eight A300B4s to replace its old B707 and B720s in January 1977. Nevertheless, Airbus now has a strong protectionism in the United States that has ruined Western's contract (Airbus, From Wikipedia).

It was Frank Borman, director of Eastern Air Lines and former astronaut, who saved the A300 program, by ordering 23 A300B4s on April 6, 1978 and launched Airbus's career in the United States. Indeed, Airbus had offered him a free rental of four new aircraft for six months, so that the company could know the reliability and profitability of the A300. EAL needed only crew training and operating costs. It took only three months in favor of CEO Borman's conclusion. As soon as the acquisition was denounced, Borman was condemned by several administrative officers as well as the CEO of Douglas. If Airbus had not selected the General Electric reactor, EAL could not resist their attacks. This man, distinguished from his career with the army and astronautics, succeeded in defending his contract with Airbus, highlighting a large number of American suppliers participating in the program of the A300, especially those of the engine (Airbus, From Wikipedia; Ville, 2006; Norris, 2010).

If the A300 program was saved, it was technically and politically thanks to the General Electric CF6 reactor, originally developed for the DC-10. In addition, when the Airbus was commissioned in 1971, before the A300 began commercial flights, it had a good reliability, which enabled Airbus to convince Eastern Airlines in 1978. G-SWJW, A300B4-203 MSN302 s 'Equipping the CF6-50C2 (Fig. 1).

The General Electric CF6 is a family of highbypass turbofan engines produced by GE Aviation. Based on the TF39, the first high-power high-bypass jet engine, the CF6 powers a wide variety of civilian airliners.

The basic engine core also powers the LM2500, LM5000 and LM6000 marine and power generation turboshafts.

After developing the TF39 for the C-5 Galaxy in the late 1960s, GE offered a more powerful variant for civilian use, the CF6 and quickly found interest in two designs being offered for a recent Eastern Airlines contract, the Lockheed L-1011 and McDonnell Douglas DC-10.

The Lockheed eventually selected the Rolls-Royce RB211, but Douglas stuck with the CF6 and the DC-10 entered service in 1971.

It was also selected for versions of the Boeing 747. Since then, the CF6 has powered versions of the Airbus A300, A310 and A330, Boeing 767 and McDonnell Douglas MD-11 (General Electric CF6, From Wikipedia).

For the CF6-80C2-A1, the fan diameter is increased to 93 in (2.36 m), with an airflow of 1750 lb/s (790 kg/s).

Overall pressure ratio is 30.4, with a bypass ratio of 5.15. Static thrust is 59,000 lb (263 kN). An extra stage is added to the HP compressor and a 5th to the LP turbine.

The CF6-80C2 is currently certified on eleven wide body aircraft models including the Boeing 747-400 and McDonnell Douglas MD-11 (Airbus, From Wikipedia).

The CF6-80C2 is also certified for ETOPS-180 for the Airbus A300, Airbus A310, Boeing 767 and, Kawasaki C-2(CF6-80C2K), as the F138-GE-100, the U.S. Air Force's C-5M Super Galaxy. A CF6-80C2K1F variant Engine for the Kawasaki C-2 can be seen in the Fig. 2 (General Electric CF6, From Wikipedia).

Airbus A300, the first aircraft launched by Airbus, introduced in 1974 (Fig. 3).

The Airbus A300 was to be the first aircraft to be developed, manufactured and marketed by Airbus.

By early 1967 the "A300" label began to be applied to a proposed 320 seat, twin engined airliner. Following the 1967 tri-government agreement, Roger Béteille was appointed technical director of the A300 development project.

While the A300 met with great commercial success against Boeing, Airbus decided to launch in July 1978 the development of a successor.

The capacity of the A300 had largely been decided in order to satisfy the needs of the Air France company but had given birth to a device a little too big for the real needs and many companies did not have enough traffic to fill Of the A300s.

To reduce the cost of research and development, Airbus plans to design the A300B10MC (A300B Minimum Change) by shortening the fuselage of an A300B in order to obtain a capacity of 220 passengers but such a device would have the disadvantage of Having an oversized and too heavy wing and landing gear, leading to an overconsumption of kerosene.

Numerous sessions of consultation between the different partners follow each other and make it possible to refine the characteristics of the future A310.

Unlike the A300, largely influenced by the political decisions of the participating countries, technical and commercial considerations predominated during the development of the A310 project and marked for the first time the emergence of a genuine Airbus industrial power against the member states.

The first model of the A310 was presented at the Hanover Air Show in April 1978 and the A300B10 was launched on 6 July 1978 by Aerospatiale, MBB, Fokker and CASA. At the beginning of 1979, Lufthansa, Swissair, KLM, Air France and Iberia have already ordered numerous copies of the A310, whose plans are becoming more and more precise.

The design effort of the A310 allows the UK and British Aerospace (BAe) to regain a role in the European aeronautics industry as new wings have to be created for the A310.

BAe is a national conglomerate that emerged from the consolidation movement of the British aerospace industry launched by the Labor government in the 1970s and the British government asks whether BAe should get closer to Airbus or an American manufacturer.

British Airways, the majority of which are American aircraft and Rolls-Royce Lld, whose RB211 engine equips the Boeing 757, are in favor of an alliance with the Americans, but Hawker-Siddeley's involvement in the A300 program With Airbus and an agreement was signed between Airbus and BAe on 27 October 1978.

The French, German, Spanish and British Governments ratified this agreement on 27 October 1978 and BAe officially joined the EIG on 1 January 1979 to participate in the development and Construction of the A310.

Conclusion

Airbus Commercial aircraft, known as Airbus, is a European aeronautics manufacturer with headquarters in Blagnac, in the suburbs of Toulouse, France. The company, which is 100% -owned by the industrial group of the same name, manufactures more than half of the airliners produced in the world and is Boeing's main competitor. Airbus was founded as a consortium by European manufacturers in the late 1960s. Airbus Industry became a SAS (simplified joint-stock company) in 2001, a subsidiary of EADS renamed Airbus Group in 2014 and Airbus in 2017. BAE Systems 20% of Airbus between 2001 and 2006. In 2010, 62,751 people are employed at 18 Airbus sites in France, Germany, the United Kingdom, Belgium (SABCA) and Spain. Even if parts of Airbus aircraft are essentially made in Europe some come from all over the world. But the final assembly lines are in Toulouse (France), Hamburg (Germany), Seville (Spain), Tianjin (China) and Mobile (United States). Airbus subsidiaries are also located in the United States, China, Japan and India. Airbus produced its first aircraft, the A300, in 1972 and offers a range of commercial aircraft ranging from the A318 to the A380, as well as aircraft and aircraft for business men and women. Airbus was the first manufacturer to install an electric flight control system on the A320. In 2013, Airbus produced 626 aircraft and won 1,503 net orders. This is the best commercial result in the history of aeronautics. At the beginning of 2017, Airbus announced that it had broken its own record of deliveries with the production of 688 aircraft this year, thus becoming No. 1.

The civil aircraft range offers 107 to 525 passengers and includes the A320 single-aisle family (A318, A319, A320 and A321), A330/A340/A350 wide-body long-haul aircraft, Mail with double deck A380. The A300, A310 and A340 are no longer produced but are still in service. The A320, A330 and A380 are in production and the A350 entered service in 2015.

The first aircraft manufactured by Airbus, the A300B, was so named because it originally had to carry 300 people as standard. Thereafter, each new model bore a name increasing from 10 to 10: A310, A320, A330, A340, the shortened or extended versions of the A320 receiving a very near number (A318, A319, A321). The name of Airbus' latest aircraft, the A380, was chosen to recall the two rows of superimposed portholes but also because the 8 is a lucky number in Asia, which is the main target market for this aircraft. Type A350 follows the usual nomenclature.

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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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