

Airlines and manufacturers in 2023

I Letter from François Robardet

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(Raison d'être of the Air France-KLM group)



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The Press Review for Monday, January 1, 2024 features:

Airlines and Manufacturers,

the main events of 2023

Dear readers,

Here you'll find nine articles published in 2023, dealing with airlines and aircraft manufacturers.

Here is the list:

- > Has Air France-KLM lost its way by acquiring a stake in SAS?*
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> Boeing turns a page in modern aviation with the delivery of the last 747

Enjoy your reading

François

Selected articles and comments

> Has Air France-KLM lost its way by acquiring a stake in SAS?

(source La Tribune) October 5 - Has Air France-KLM lost its way by positioning itself in SAS AB, the SAS Scandinavian Airlines group? **Why invest in an airline that was placed under Chapter 11 bankruptcy protection a year ago**, posted a negative operating margin of 7% over the first three quarters of its 2022-2023 fiscal year, posted a net loss of 325 million euros - after having already lost nearly two billion euros over the last three fiscal years - and has a debt of 2.6 billion euros?

On the face of it, the picture doesn't look too rosy. However, one thing is certain: Benjamin Smith, CEO of Air France-KLM, didn't go there just to rub Lufthansa's nose in it (although that part is not negligible). First and foremost, the **company is in a recovery phase, with traffic up sharply in the last quarter** (May to July, SAS being in the off-year period) **and its first operating profit in a long time. It is also well advanced in its restructuring** within the framework offered by Chapter 11, under the leadership of Dutch CEO Anko van der Werff, who had already cut his teeth in a similar situation at Avianca between 2020 and 2021. The aim is to exit this arrangement by the end of the year. **Finally, SAS has begun renewing its fleet, switching to Airbus with A320 NEOs and A350s.**

The Scandinavian market also offers real prospects, with its high propensity to travel and a premium dimension that is far from negligible, and despite the difficulties accumulated over the last ten years, SAS remains the dominant player. **We're talking about 4 trips per inhabitant per year in Scandinavia**," explains Mathieu Blondel, head of the aviation competence center at Arthur D. Little. Little. **This ranges from 3 in Sweden to 4 in Denmark and 7 in Norway. By comparison, France is 1.8, Germany 1.9 and the UK 2.7.**

Although the population pool is limited, and the "flygskam" ("shame on flying") movement of Swedish environmental activist Gretha Thunberg was born in Scandinavia, there is a real appetite for travel, whether within the Nordic countries or southwards in search of the sun, and both the local geography and

the peripheral nature of this region in relation to Europe favor the use of airplanes. Air France-KLM also makes this point.

However, these data date from before the pandemic, and the upturn in traffic is weaker than in the rest of Europe. According to ACI Europe, traffic in the first eight months of the year in Sweden was still over 20% lower than in the same period in 2019, over 13% lower in Denmark and 8.5% lower in Norway. The EU average is 7%. And as an analyst interviewed last year noted, **Scandinavia is far from offering the same prospects as a market like Italy, where Lufthansa preferred to position itself by embarking on the acquisition of ITA Airways**. He pointed out that Scandinavia (which does not include Finland) has a population of just 22 million. In any case, **the Franco-Dutch group will now be able to gain a foothold in a market that had previously eluded it, unlike Lufthansa, which had signed major commercial agreements with SAS**. This will enable it to reach new destinations in this zone, where SAS is in a dominant position. For the time being, competition from ultra-low-cost carriers such as Ryanair and Wizzair is still limited, according to Mathieu Blondel, who draws a comparison with ITA Airways in Italy. A view not necessarily shared by all, with some noting the strong presence of low-cost carriers on north-south European routes. According to Official Aviation Guide (OAG) data for 2022, Ryanair accounted for 7% of supply in Scandinavia, with strong growth, and Wizzair for 3%. And Norwegian's pending takeover of Widerøe could also shake up this market.

Air France-KLM's aim is also to attract Nordic passengers to its Paris-CDG and Amsterdam-Schiphol hubs, so that they can travel on its long-haul networks. This will take the wind out of Lufthansa's sails, which until now have routed them via Frankfurt and Munich. **However, the French group is not expected to clip SAS's wings at its Copenhagen and Stockholm hubs, which are well positioned to serve North America, despite the weakness of SAS's long-haul fleet** (12 A330s and A350s). The company's northern position also offers the possibility of polar routes with medium-haul aircraft, with SAS operating three long-range A321 LR. SAS controls half of the 400,000 to 500,000 seats offered on these routes between Scandinavia and North America, well ahead of Finnair (despite its repositioning) and emerging players such as Norse.

With SAS, Air France-KLM is also acquiring a company with a premium positioning, in line with the Group's desire to move upmarket. As Mathieu Blondel points out, it will be necessary to revitalize a somewhat aging brand, "but one whose DNA has great potential", rather like what Lufthansa did with Swiss fifteen years ago. An interesting prospect in view of the Scandinavian countries' higher-than-average purchasing power, but also tempered by the analyst interviewed last year, who again warned against overestimating the size of the market. In the same vein, SAS has a powerful EuroBonus loyalty program, with over 5 million members, over which it has retained control.

To develop a genuine commercial partnership with Air France-KLM, **SAS must first leave Star Alliance**, the global alliance of which it is a founding member alongside Lufthansa and United Airlines. This could happen **as early as the second quarter of 2024**, suggests an insider. From then on, Air France-KLM could enter into code-share agreements, or even integrate the Scandinavian airline into its transatlantic joint venture (the highest level of collaboration prior to a merger) with Delta Airlines and Virgin Atlantic. This would upset the balance of power in the North Atlantic, which had hitherto tended to favor Star Alliance.

Delta Airlines did not take part in the transaction, but lent its support to Air France-KLM's acquisition of a stake in SAS. In the long term, it is even likely that SAS will join SkyTeam.

In fact, this will break the current agreements with Lufthansa. If Air France-KLM succeeds in completing the turnaround of SAS and including it in a truly integrated and coherent strategy (which took them almost twenty years between Air France and KLM), the **German group will be able to bite its fingers off. Lufthansa had forged very close links with the Scandinavian airline and was the obvious candidate for its takeover**, having already shown an interest on several occasions in the past. In recent years, however, he has clearly preferred to remain on the sidelines, relying on his various commercial agreements with SAS to attract a share of the market without having to manage the company's turnaround. And in the end, he preferred to concentrate on acquiring ITA Airways at the expense of Air France-KLM.

It's still too early to say whether Air France-KLM or Lufthansa made the better move, but these are two major strategic moves while we wait to see what happens to TAP Air Portugal, put up for sale by the Portuguese state. When all is said and done, Europe's skies will have undergone a major consolidation phase, capable of redefining the balance of power for the next decade.

My comment: *The Air France-KLM group is (finally) taking part in the consolidation of European air transport.*

SAS has selected Air France-KLM from a consortium including Castlelake and Lind Invest.

The two favourites (the investment fund Apollo Global Management Inc. and the Lufthansa group) were eliminated.

The surprise was twofold.

Firstly, because the investment fund Apollo Global Management Inc. had granted SAS a \$700 million bridging loan last year. Secondly, because relations between Lufthansa and SAS seemed to be on the up.

As soon as the choice of buyers was announced on Tuesday, investors took fright.

SAS Scandinavian Airlines shareholders rushed to sell as many of their shares as possible. By mid-day, the share price had plummeted 82% to 5 cents.

SAS management had been warning of this risk for several quarters, but until the end, the SAS share price "defied all logic and reason", noted Sydbank chief analyst Jacob Pedersen in a note.

In a press release SAS announced on Tuesday evening, October 3, that the consortium of investors comprising Air France-KLM and the Castlelake and Lind Invest funds would invest a total of \$1.18 billion (€1.12 billion) in the troubled airline alongside the Danish state, taking a stake of around 86%. The remaining share capital would be held by creditors who have agreed to a debt-for-equity swap, bearing in mind that SAS AB's existing shares are due to be cancelled and delisted in 2024.

"As a result, no value is expected for existing SAS AB shareholders, and only a modest recovery rate is anticipated for holders of convertible bonds," said SAS.

> **Privatization of TAP Air Portugal may be delayed**

(source AFP) December 16 - As the Portuguese government embarks on the process of privatizing TAP Air, it will be hard pressed to meet its commitments.

The original timetable for the privatization of state-owned TAP Air Portugal is likely to be delayed by the political crisis in Portugal, which led to the call for early legislative elections in March, TAP CEO Luis Rodrigues said on Friday.

Privatization, launched by the Portuguese government in September, "**is possible in 2024, but it will be difficult** (...) the timetable seems complicated", said the TAP executive on the sidelines of a meeting with the foreign press at the company's Lisbon headquarters.

Portugal plunged into political crisis after the resignation of Socialist Prime Minister Antonio Costa, whose name was implicated in a case of influence peddling, leading to the calling of early legislative elections on March 10. "**We won't have a new government before the end of April or May**", so privatization in 2024 "is not impossible, but I wouldn't bet on it", Mr. Rodrigues told AFP.

(...)

My comment: *Patience and length of time are more important than strength and rage.*

This moral of La Fontaine, still valid in the Alitalia / ITA Airways case, now applies to the TAP Air Portugal case.

We'll have to wait for a new government to be formed, after the early elections of March 10, 2024, for the sale of the Portuguese airline to move forward.

> **ITA Airways/Lufthansa merger finally on the EU agenda**

(source La Quotidienne) December 5 - **The notification of the ITA Airways Lufthansa deal has arrived on the EU's desk: after months and months** - in line with what Prime Minister Giorgia Meloni had hoped for last week - the decisive step towards the completion of Lufthansa's entry into the Italian carrier's capital has just been formally and officially communicated by the Mef to the EU Competition Commission. At the same time, **Lufthansa has also notified the European Commission of its acquisition of a 41% minority stake in ITA Airways.**

The Commission will now open its formal investigation procedure. The deadline for the first phase of the analysis is January 15, 2024.

In the event of a negative assessment, and with the question of routes still to be resolved, the investigation could continue for another three and a half months, thus arriving in the spring of 2024.

The notification landed on the table of EU Competition boss Didier Reynders, after a discussion that led the parties to dissect and anticipate all possible obstacles to the smooth running of the internal market, and to try to put in place solid remedies that demonstrate EU Control.

(...)

My comment: *The process of buying out an airline is long and full of pitfalls*

Lufthansa is encountering the same difficulties as Iberia in its takeover of Air Europa.

After more than 75 years in business, ITA Airways will be leaving Milan Malpensa airport at the beginning of January 2024 to concentrate on the Milan Linate hub and its main hub, Rome Fiumicino.

Fierce competition on the New York - Milan long-haul market and the lack of hub-and-spoke traffic to Malpensa have made the decision inevitable.

> **IAG seeks EU antitrust clearance for acquisition of Air Europa**

(Reuters source) December 11 - **IAG**, which owns British Airways and Iberia, **has said it is prepared to offer an ambitious and wide-ranging package of remedies to address the European Commission's concerns about the deal**, and is committed to closing the transaction as soon as possible in 2024. "

Today we notified the European Commission of our proposed acquisition of **Air Europa**. The transaction will benefit consumers and the wider Spanish economy, and improve Madrid's competitiveness compared to other European hubs," IAG CEO Luis Gallego said in a statement.

In February, IAG said it had agreed to pay 400 million euros (\$429.80 million) to Spanish company Globalia for the 80% of Air Europa it did not already own.

IAG is likely to sound out various rivals, both European and non-European, to see if they are interested in the corrective measures. Airline mergers usually involve giving up airport slots to meet competition concerns, as well as access to frequent flyer programs.

My comment: Iberia's offer to buy Air Europa dates back to November 2019.

When Iberia made its intention to acquire Air Europa official in August 2022, the European Commission initiated discussions with the IAG group.

The European Commission considered that the transaction, as proposed, would give rise to competition concerns on some 70 routes on which Iberia and Air Europa were the main or even sole operators, notably between Spain and America.

The outcome of negotiations between the European Commission and IAG to resolve these issues should be known shortly.

> **Corsair airline saved... by an African state**

(source Capital) December 20 - **The airline Corsair could finally breathe a sigh of relief**, reports Le Figaro. Founded in 1981 and based at Orly, it mainly serves the French overseas departments. The company is not in financial difficulty, "is doing very well" and has "no cash flow difficulties", confirmed CEO Pascal de Izaguirre in December 2022. But like all other company CEOs, he demanded that its "financial debt" be "renegotiated". **A recapitalization of the 30 million euros needed to repay the loans taken out during the Covid-19 pandemic.**

Unlike other airlines, which returned to profit in 2022, Corsair did not generate any profits. In other words, without an injection of funds, **Corsair would risk bankruptcy.** But according to information from Le Monde and Le Figaro, investors have knocked on the door to avoid such an outcome, as experienced by XL Airways or Aigle Azur, for example, which failed to recover from the pandemic. **Two groups of investors have agreed to advance funds.** The first is **the pool of West Indian tourism players, and the OMRP holding company which took over Corsair in 2020.** This entity will put 15 million euros on the table.

"Today, we own 10% of the company. We will participate in this recapitalization. I don't know how much, but we believe in the carrier's business model," Laurent Abitbol, head of the Havas Voyage travel agency network, confirmed to Le Figaro.

But there is **another investor, and not the least, rather surprising: the Republic of Congo**. A player in the air tourism industry explains: "This country wants to do away with Air France's monopoly on the Paris-Brazzaville route, which offers few flights and is driving up ticket prices." He explains that a Paris-Brazzaville flight today costs twice as much (2,000 euros) as a Paris-Tokyo flight. Why is Congo ready to inject 15 million euros? **Because the state doesn't have a national airline any more, and re-launching one would cost a lot more.**

So there will be no "marriage" with Reunion's Air Austral, any more than with Air France. However, **while this breakthrough is reassuring, there are still a number of stumbling blocks. Corsair must first convince the French government to waive part of its tax and social security debts. Then, above all, it will have to convince Brussels.**

The problem, according to an air transport specialist, is that it is not normally possible to approach Europe twice in less than ten years "to obtain its approval for a plan involving state aid". Brussels will also have to judge whether the new state aid distorts competition, adds Le Figaro. The case is therefore moving forward, but Corsair is still far from being saved.

***My comment:** Corsair faces recurring financial difficulties in the autumn.*

It's difficult to know exactly why, as Corsair, whose fiscal year ends in September, has published neither its 2022 nor its 2023 financial statements!

If it is confirmed that Corsair did not make a profit in 2023, the airline will be forced to question its cost structure.

A clarification on Corsair's demands. According to BFM Business, "the company has asked the French government, through the inter-ministerial industrial restructuring committee, to write off or at least restructure 147 million euros in tax and social security debts".

> Corsica: low-cost carrier Volotea threatens the duopoly of Air Corsica and Air France

(source Les Echos) August 9 - There's a storm brewing in Corsica. **For the first time, Air Corsica and Air France are facing a serious competitor for subsidies on the main routes between the island and the mainland.**

On July 13, the Spanish low-cost carrier **Volotea applied for the tender launched every four years by the Corsican Transport Office (OTC)**. The aim is to win the next air public service delegation for 2024-2027, on routes between Paris-Orly and Marseille on the one hand, and Ajaccio and Bastia on the other. These routes currently

account for the bulk of the business of Air Corsica and Air France, long-standing partners on services to Corsica.

This is the first time that a European low-cost airline has applied for a public service delegation (DSP) in Corsica. EasyJet, which serves Corsica from Roissy-CDG, hasn't even tried. But Volotea already has a strong presence on Corsica, where it already accounts for "80% of the overall offer, with 29 destinations served", without a penny of public money. If its bid wins, Volotea promises to increase its offer in Corsica from 900,000 seats to 1.5 million within three years, with the opening of ten new routes and the creation of an operating base on the island, with local aircraft and jobs at stake, and above all, cheap tickets.

Enough to seduce. However, **while Volotea's bid for the OTC tender is theoretically good news for competition and consumers, it seems to have rather embarrassed the island's authorities. The award of public service delegations on the four routes is a major issue for the future of Air Corsica, 65% of whose capital is held by the Corsican regional authorities and 14% by Air France.**

Air Corsica's unions and a number of local elected representatives have made no mistake in denouncing Volotea's bid. (..

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The official decision of the Corsican Assembly will probably not be taken before the end of November. But while local pressure is strong for Air Corsica and Air France to renew their public service contracts, the Corsican authorities cannot dismiss Volotea's candidacy out of hand. **The selection process for the best candidate is closely controlled by French and European regulations, and the best bidder is expected to win.**

Any breach of this rule is likely to result in an appeal to French and European institutions, with heavy fines and the annulment of awards in the event of irregularity. The Collectivité de Corse has already experienced this with its maritime links. In September 2021, the Conseil d'État ordered it to pay 86.3 million euros to Corsica Ferries, in compensation for "illegal subsidies" to SNCM between 2013 and 2017, after the European Commission had also ordered SNCM to repay 220 million euros in undue aid between 2007 and 2012. These condemnations accelerated SNCM's bankruptcy.

Air fares to Corsica remain a sensitive issue, particularly for residents. Despite subsidies, the resident fare for a round trip to Paris is already 199.85 euros (including 69.85 euros tax) and 100.91 euros to Marseille. But it is set to rise by a further 10 euros in 2024, despite a 33 million euro extension granted to the OTC to keep pace with inflation. However, one of Volotea's main arguments is its ability to offer lower fares, thanks to lower costs and the size effect already achieved on the Corsican market. At a time of inflation and falling tourist numbers, it's hard to remain

totally unmoved by the siren calls of low-cost airlines.

My comment: *Three bids have been submitted for the 2024-2027 public service delegation between Corsica and the mainland.*

Air Corsica has applied for the on-board service (routes between Corsica and Nice or Marseille); Air Corsica and Air France for routes to and from Paris-Orly and finally Volotea for 4 lots (details not specified).

The future of Air Corsica and Air France employees in Corsica will depend on the final choice. It is to be hoped that the social aspects will be taken into account before the financial ones.

> Airbus knocks out Boeing as 2023 draws to a close

(source Tourmag) December 19 - **If the duel between Airbus and Boeing were a boxing match, the referee wouldn't have waited until the end to announce the winner.** It's a real knockout victory in round 3.

Imagine that in the space of a week, from Turkish Airlines to easyJet, via Avolon, **the manufacturer has booked** orders for 521 new aircraft to be produced over the next few years.

In 2013, its historic year, Airbus had booked 1,503 orders; the tally reaches **1,883 net orders over the year 2023, according to** the accounts of our confreres at La Dépêche.

To arrive at these Dantesque statistics, Airbus has recorded XXL orders in recent days from Turkish Airlines (220 aircraft, including 150 A321s, Airbus' best-seller, and 70 wide-body A350s), Avolon (100 A321neo aircraft), Azul Linhas Aéreas (four A330neos), easyJet (157 aircraft from the A320neo family) and finally Lufthansa, with an order for 40 Airbus A220s. All in all, the workshops in Toulouse and all over Europe have a lot to look forward to, as **the teams will have 11 years of work ahead of them! The order book now stands at over 8,000 aircraft, compared with 6,000 for Boeing,** according to Les Echos.

These announcements are at odds with the emissions reduction targets required for tourism. While these aircraft are less polluting, the increase in the number of air journeys and planes in the sky is unlikely to reduce the sector's footprint, even though experts are calling for tourism to decouple its growth from that of air travel.

My comment: *The challenge for both Airbus and Boeing in the years to come will be to deliver to their customers on time.*

> China's C919 medium-haul aircraft finally flies...

(source Journal de l'Aviation) May 30, 2023 - "Competitor to Airbus and Boeing", "rival to the A320neo", "a real turning point for the Chinese air transport sector"... The least we can say is that the non-specialist press has had a bit of a field day over the past two days, with the first commercial flight of the COMAC (Commercial Aircraft Corporation of China) C919.

The Chinese single-aisle aircraft linked the Shanghai Hongqiao and Beijing Daxing hubs on May 28, flying the colors of its launch operator China Eastern, with 130 passengers on board. While this is an important event for the Middle Kingdom's aviation industry, and one that has been hailed by the world's two leading aircraft manufacturers, it's not the end of the story.

The Chinese medium-haul program is now seven years behind schedule, and the hardest part is yet to come, with production still to ramp up to meet COMAC's ambitious target of 150 aircraft a year within 5 years.

The spectre of the difficulties encountered on the ARJ-21 program, the first Chinese-designed commercial jet to go into series production (less than a hundred examples in fifteen years), is still very much present, and it will take a long time to deliver the 1,200 or so aircraft officially contracted by the aircraft manufacturer for its new 180-seat single-aisle jet (orders and purchase intentions). Beijing will logically provide the resources (Airbus and Boeing do not benefit from the same level of state support, limiting export sales of the C919), but it's not certain that this will be enough. In the

meantime, **commercial flights operated by the C919 will be closely scrutinized over the coming months, to get an initial idea of the aircraft's availability rate.** It should also be remembered that **if the C919 is flying today, it's thanks to a major contribution from Western aircraft manufacturers. Its LEAP-1C engines are produced by CFM International (a 50/50 joint venture between Safran and GE Aerospace), the nacelles by Nexcelle (Safran Nacelles and Middle River Aerostructure Systems), its avionics systems by Collins Aerospace and GE, its APU, wheels and brakes by Honeywell, its complete landing gear and air conditioning system by Liebherr-Aerospace...** The medium-haul jet is cruelly dependent on American and European technological know-how, a fact that is worth remembering in view of China's ambitions, and which will be particularly difficult to replace in less than three decades.

The industrial and commercial success of COMAC's C919 is therefore intimately linked to Sino-American relations, which are already atrocious and are obviously destined to come to a complete halt in the event of an attempt to take control of Taiwan by force. In that case, the C919 wouldn't make much more history than the Shanghai Y-10, the Chinese copy of the 707 that flew in the early 80s.

So does this new "competitor to Airbus and Boeing" really represent a threat to the world's commercial aircraft duopoly? As we know, Airbus and its industrial partners

are already planning a new generation of single-aisle jets for the next decade. Boeing will obviously do the same once all variants of its 737 MAX family are back on track. As for China's C919 medium-haul aircraft, it's finally flying...

My comment (1): Here we see that, apart from the aircraft's structure, most of the components of the Chinese Comac C919 are manufactured far from China.

No surprise there. In fact, all three major aircraft manufacturers (Airbus, Boeing and Comac) use the same equipment and engine suppliers for their planes.

The best example comes from engines: CFM International (a 50/50 joint venture between Safran and GE Aerospace) supplies Airbus with LEAP-1A, Boeing with LEAP-1B and Comac with LEAP-1C, engines with similar characteristics.

My comment (2): What's Chinese about the Comac C919?

The infographic below provides some answers. The fuselage, wings and empennage are Chinese. The rest is French, English, German or American.



This is anything but a surprise, since the same applies to Airbus and Boeing. With the exception of fairings, all other components are sourced from outside the manufacturer.

Engines, for example, represent 25% of the aircraft's value. Three engine manufacturers offer solutions:

- Rolls-Royce, whose Trent turbojet engine family powers Airbus A330, A340, A350 and A380, as well as Boeing 777 and 787 aircraft.
- Pratt & Whitney with its PW1000G (A320 NEO) and PW4000 (Boeing 777 and Airbus A330) engines

- *CFM International, a joint venture founded in 1974 by Safran and General Electric. They are behind the world's best-selling jet engine series: the CFM56.*

This turbojet powers some 15,000 aircraft worldwide, mainly the Boeing 737, the Airbus A320 family, and the Airbus A340-200 and A340-300.

Their latest model is the LEAP. This engine, destined to replace the CFM56, powers some of the new Airbus A320 NEO, Boeing 737 MAX and COMAC C919.

- *General Electric also builds engines powering the Airbus A300, A310, A330, A380, Boeing 747, 767, 777, 787 and the Bombardier CRJ-700, 900, 1000.*

> Boeing turns a page in modern aviation with the delivery of the last 747

(source Les Echos) January 31, 2023 - **A page in modern American history has been turned.** On **Tuesday, Boeing delivered the last of its 747s** from its Everett plant near Seattle, Washington, after nearly 55 years of production for more than a hundred customers. **The 1,574th and final aircraft is a 747-8 Cargo**, assembled for the American freight company Atlas Air Worldwide, and ordered at the beginning of 2022 along with three others.

For several decades, the Boeing 747, with its curved front to accommodate an upper deck, was the "Queen of the skies": the symbol of modernity, consumerism and leisure, but also of the innovative capabilities of American engineering.

"This plane was a young pilot's childhood dream," recounts an Air France pilot who flew the "classic" Boeing 747 for several years, the 747-200 and 300, to Les Echos: "It was the symbol of travel, the plane you saw in American TV series. And it flattered pilots' egos a lot, because it's so high up, you had to go upstairs to get to the cockpit."

Launched in 1966 by Boeing's CEO and the CEO of Pan Am, who agreed to buy the first examples, the aircraft was **developed in record time in a custom-built factory**. The first 747-100 took to the skies on February 9, 1969, bound for Paris and the Le Bourget Air Show.

"The plane was still being tested, so it was a bit risky to go from Seattle to Paris," says Mike Lombardi, an aircraft manufacturer historian. "There was fog at Le Bourget, it lifted and the 747 appeared at the end of the runway, just before landing. The communications department couldn't have dreamed of a better introduction to the world!"

The 747 is the first aircraft to feature two aisles in its cabin, capable of carrying 440 passengers over a range of more than 10,000 kilometers. Further versions of the 747-400ER will extend its range to over 14,000 kilometers. "It was a huge liner, but it was actually very easy to fly and very reliable, with direct control

cables, like a Cessna," says the Air France pilot.

The first model and its variants have shaped modern American memory and imagery, from the version modified by NASA to carry the space shuttles, to the one transformed into Air Force One in 1990, at George Bush's request. Boeing has yet to deliver two used 747-8s, purchased by the Pentagon in 2017 to be modified as presidential aircraft.

The "cargo" versions of the 747 also symbolize the great era of globalization and trade, from an order from UPS in 2005 to this latest delivery to an air freight company, which could be in use well into the 2050s. The 747-8 Cargo started its career in 2010, while the first 747-8 Intercontinental, for passengers, was delivered two years later, this time with mixed success.

The aircraft's weak point, which would signal the end of its career, was its unbridled fuel consumption and high maintenance costs. The advent of low-cost airlines also contributed to the decline, with a preference for smaller aircraft for shorter flights.

Over the years, most of the major airlines - from Air France and British Airways to Lufthansa and Qantas - have sold off their 747 fleets or scrapped them, trading in their hulls for the price of metal. "

We all want lower emissions, and that's what the 777 has. We've built something better, and that's what explains the end of 747 production," says Boeing historian Mike Lombardi. **Even so, the era of the jumbo jet is struggling to bounce back. The Airbus A380 program lasted only a few years, and deliveries of the 777-X, the upgraded version of Boeing's triple 7, have again been postponed.**

By inviting the engineers and all those who made the history of the 747 program on Tuesday for the final delivery, Boeing is offering itself a breath of nostalgia, at a time when the company is still experiencing severe turbulence since the 737-Max crisis. According to the Seattle Times, part of the Everett hangar dedicated to 747 assembly will house an additional assembly line for the 737-Max. A new horizon for Boeing.



My comment: *The reasons for stopping production of the B747 (and A380) are to be found on the engine side.*

The first reason is the principle of redundancy. In the 1950s, jet-engine technology was quite new, and despite being more reliable than piston engines, it was not uncommon for an engine to fail mid-flight. So by having 4 engines, we were sure of being able to cope with this problem without threatening flight safety.

The second reason was that the technology was not yet mature. Without going into too much detail, the jet engines of the time were almost 5 times less powerful and efficient than today's engines. In those days, more engines were needed to move the same weight as today.

The third reason concerns air law. Regulations required that an aircraft over the ocean must always be within a 90-minute flight of a diversion airport. However, this rule could be waived if the aircraft was equipped with more than two engines. Having 4 engines meant that this rule could be waived, and faster, more direct routes established between the two sides of the Atlantic.

In the early 1980s, more powerful and, above all, more reliable engines were introduced. The concept of Extended-range Twin-engine Operational Performance Standards, or ETOPS, was born.

After evaluation by aviation regulators, ETOPS enabled certain twin-engine aircraft to fly over the ocean more than 120 minutes from a diversion airport. The first ETOPS flight took place on February 1, 1985. But these aircraft had little passenger capacity.

Little by little, the engines were improved. Power output increased, fuel consumption was reduced and reliability improved. On the same route, quadjets became more difficult to make profitable than twinjets.

Gone are the days of the long-haul quad-jet, replaced by the twin-engine Airbus and Boeing flagships: the A350 and B777.

Note: the above information is taken mainly from the informaero website.

> **TITLE10**

(source LesÉchos) December 28 - The

My comment: We

End of press review

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| François Robardet

former Director of Air France-KLM.

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At the time of our election, Nicolas and I received the support of the CFDT and the UNPNC.

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