



The first Boeing 747 to be operated by the British Overseas Airways Corporation arrives at London's Heathrow Airport in May 1970. Photo: Jimmy Wilds/Getty Images

ARCHITECTURE + DESIGN

# How the Boeing 747 Changed the Way Airplanes Are Designed

On the anniversary of its first test flight in February 1969, AD looks back on how the “Queen of the Skies” became the most famous plane in the world

By Stefanie Waldek

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If you ask Sir Norman Foster what his favorite building is, you'll find that it's not a building at all, but an airplane. And it's not just any airplane, but the Boeing 747, the pinnacle of commercial aviation. “The fact that we call this an aeroplane rather than a building—or engineering rather than architecture—is really a historical hangover, because for me, much of what we have here is genuinely architectural both in its design and its thinking,” he once said in an episode of the BBC show *Building Sights*.

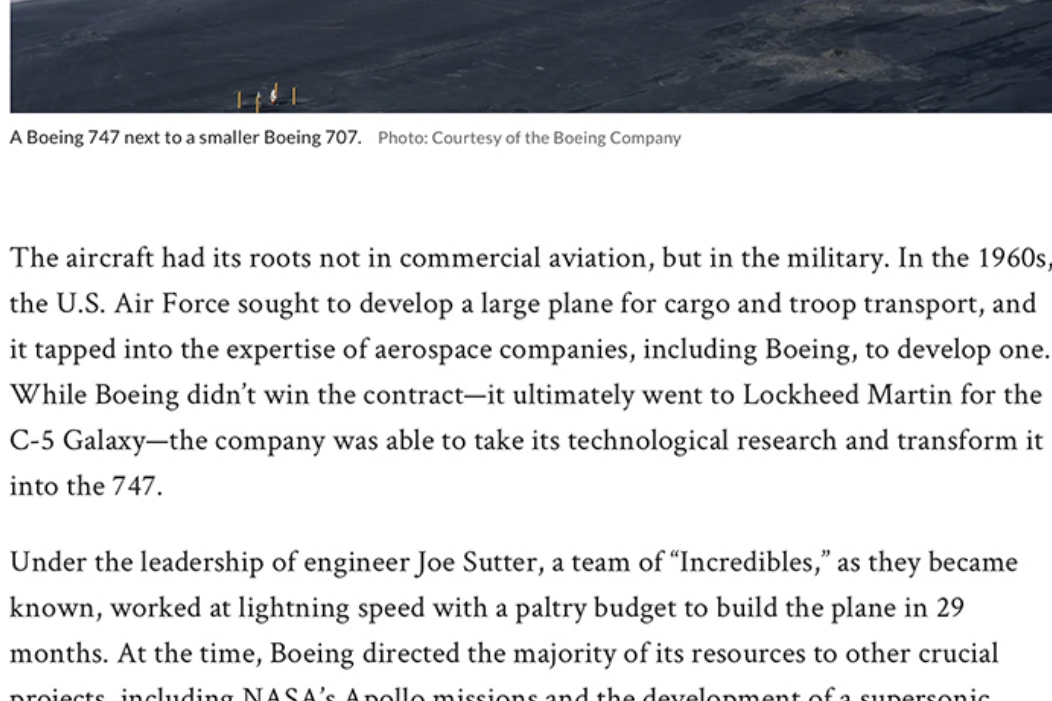
Known as the Queen of the Skies, the 747 revolutionized air travel when it made its commercial debut in 1970, allowing travelers to globe-trot farther than ever before, faster than ever before, and perhaps with more flair than ever before. And more than 50 years later, its design legacy lives on in contemporary aircraft—and in the hearts of aviation lovers around the world.



The rollout of the 747. Photo: Courtesy of the Boeing Company

Between 1903 and 1939, aviation escalated from the Wright Brothers' spruce plane to the very first jet, an astonishing engineering achievement. From there, commercial travel took off, entering the Golden Age of Flight, when passengers donned their finest suits and dresses to board a plane, then wine and dined on white tablecloths at cruising altitude. The era culminated in the largest, most impressive plane of them all: the 225-foot-long, 60-foot-tall 747, the world's first jumbo jet.

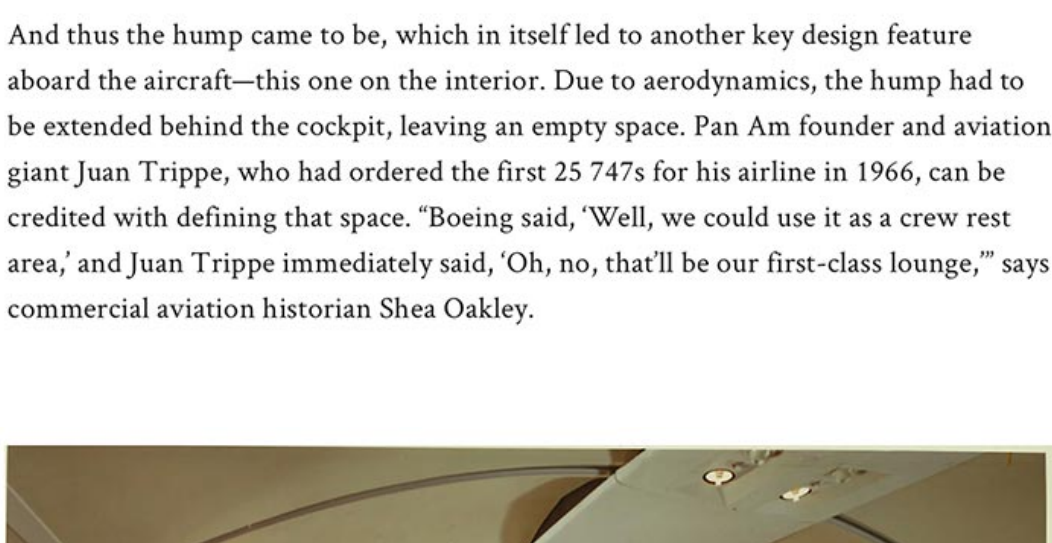
“The main thing that really captured everybody's attention and their imagination at the time that the airplane came out is its incredible size,” says Boeing's senior corporate historian Michael J. Lombardi. “When you put it next to the 707, which was the biggest jetliner of its time in the 1960s, the 747 is twice the size.”



A Boeing 747 next to a smaller Boeing 707. Photo: Courtesy of the Boeing Company

The aircraft had its roots not in commercial aviation, but in the military. In the 1960s, the U.S. Air Force sought to develop a large plane for cargo and troop transport, and it tapped into the expertise of aerospace companies, including Boeing, to develop one. While Boeing didn't win the contract—it ultimately went to Lockheed Martin for the C-5 Galaxy—the company was able to take its technological research and transform it into the 747.

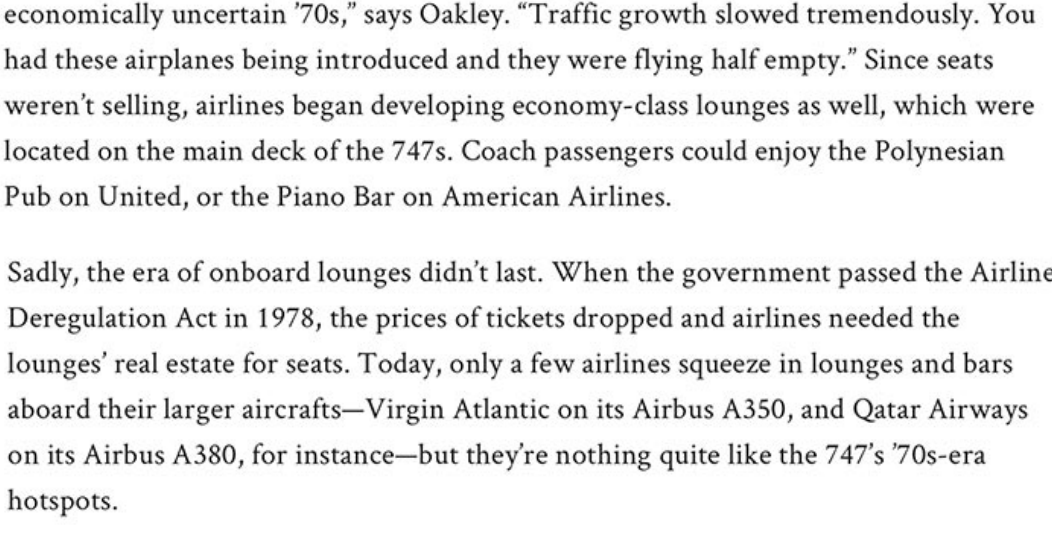
Under the leadership of engineer Joe Sutter, a team of “Incredibles,” as they became known, worked at lightning speed with a paltry budget to build the plane in 29 months. At the time, Boeing directed the majority of its resources to other crucial projects, including NASA's Apollo missions and the development of a supersonic transport, or SST, which was supposed to be the future of passenger air travel. (Only two SSTs ever ended up entering service: the Concorde and the Tupolev Tu-144, while Boeing's funding was cut, thus ending the program.)



Boeing's mock-up for the Tiger Lounge, complete with the 747's iconic spiral staircase. Photo: Courtesy of The Boeing Company

The 747 was originally designed to ferry passengers for just a few years, as Boeing's SST was being finalized, before being converted into a cargo carrier. And it was that cargo purpose that led to the aircraft's defining exterior design element: her hump. “The best way to load freight onto an airplane is straight down the length of the fuselage. They thought the best way to do this with the 747 is to have a nose that tilts up,” says Lombardi. “Well, if you do that on a conventional airplane, the flight deck is right there in the way. So the way to fix that is to put the flight deck up on top of the fuselage.”

And thus the hump came to be, which in itself led to another key design feature aboard the aircraft—this one on the interior. Due to aerodynamics, the hump had to be extended behind the cockpit, leaving an empty space. Pan Am founder and aviation giant Juan Trippe, who had ordered the first 25 747s for his airline in 1966, can be credited with defining that space. “Boeing said, ‘Well, we could use it as a crew rest area,’ and Juan Trippe immediately said, ‘Oh, no, that'll be our first-class lounge,’” says commercial aviation historian Shea Oakley.



Qantas's Captain Cook Lounge for first-class passengers. Photo: Courtesy of Qantas

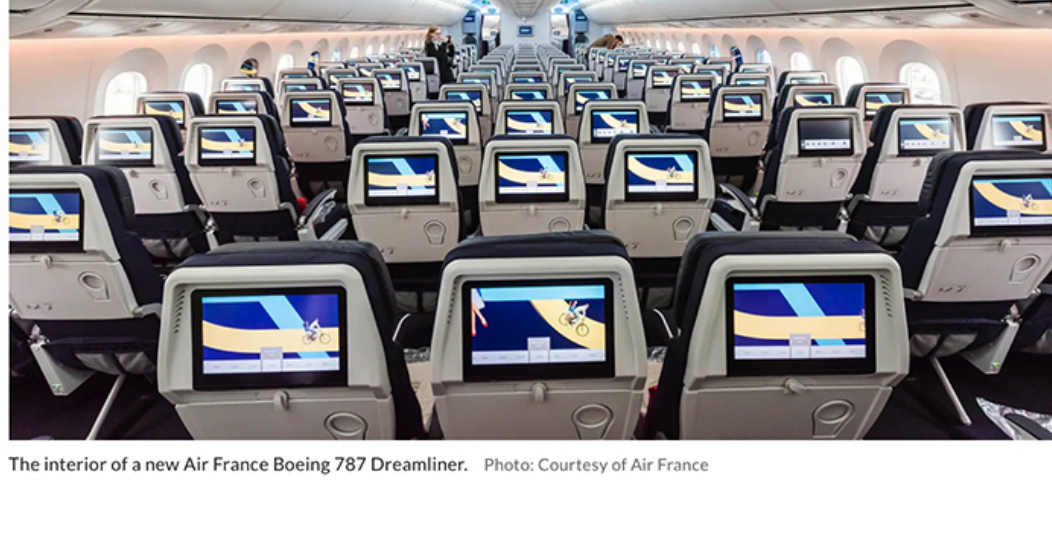
Flying in the '60s and '70s was a luxurious affair, and it was only logical that passengers aboard the world's largest plane would need an elaborate lounge for relaxation, socialization, and even entertainment. Airlines, which are responsible for outfitting their aircrafts' cabins, went above and beyond in these spaces. For instance, Qantas developed the nautical-themed Captain Cook Lounge, while Japan Airlines (JAL) installed the Tea House in the Sky.

But onboard lounges weren't only for first-class passengers. “Just as the airplane was being introduced, the U.S. was in recession, and the booming '60s turned into the economically uncertain '70s,” says Oakley. “Traffic growth slowed tremendously. You had these airplanes being introduced and they were flying half empty.” Since seats weren't selling, airlines began developing economy-class lounges as well, which were located on the main deck of the 747s. Coach passengers could enjoy the Polynesian Pub on United, or the Piano Bar on American Airlines.

Sadly, the era of onboard lounges didn't last. When the government passed the Airline Deregulation Act in 1978, the prices of tickets dropped and airlines needed the lounges' real estate for seats. Today, only a few airlines squeeze in lounges and bars aboard their larger aircrafts—Virgin Atlantic on its Airbus A350, and Qatar Airways on its Airbus A380, for instance—but they're nothing quite like the 747's '70s-era hotspots.

Still, the legacy of the 747s' interiors lives on elsewhere in today's aircraft: many of its other design features have become standard aviation-design lexicon.

For the 747, Boeing and its longtime cabin design partner Teague developed what was called the “Superjet Look,” alternatively known as the “wide-body look,” which is still used in today's aircraft. The 747 was the first wide-body commercial aircraft, meaning it had two aisles, providing passengers with more space than ever before—in fact, the airlines started calling this era the “Spacious Age.” All that space provided room for things like overhead storage, which was first introduced on the 747; before, planes only had hat racks like trains. It also was the first aircraft to feature indirect lighting as well as the regular implementation of in-flight entertainment systems.



The interior of a new Air France Boeing 787 Dreamliner. Photo: Courtesy of Air France

Unfortunately, as technology improved to create newer planes like the Dreamliner, the 747 began to fall behind in fuel efficiency (and therefore cost efficiency), the sun is now setting on the legendary aircraft. Commercial airlines have been retiring their 747s at an increasing rate, thanks in part to the COVID-19 pandemic, which has significantly hurt the aviation industry. As such, Boeing announced in July this year that it would end production of the 747 in 2022.

But that doesn't mean the 747 will be gone for good any time soon. “Now that the airlines are retiring their 747s left and right, they are often being converted into cargo planes,” says Oakley. “So in a sense, the 747 is fulfilling its original cargo role later in life.”



The interior of a private 747 by Alberto Pinto Interior Design. Photo: Courtesy of Alberto Pinto Interior Design

Some 747s, however, are staying on the passenger side of operations—as massive private jet. In 2018, Alberto Pinto Interior Design debuted the world's largest private jet, a converted 747.

“The Boeing 747 is the Holy Grail for designers in general and aircraft interior designers in particular. As everyone knows, this plane has become a myth,” says Yves Pickardt, lead aviation designer at Alberto Pinto. “It alone represents all that modern aviation has achieved in terms of technology and comfort. And for passionate aviation professionals like us, it is the most beautiful subject to motivate our creativity.”

The opulent interiors of the jumbo jet recall a nautical, Art Deco-inspired look, which could be taken as a nod to Pan Am's nautical theme from the 1930s.

“For a designer, the first advantage of this aircraft is obviously its large available surface area of 4,500 square feet, on two decks,” says Pickardt. “With such a potential, most of the constraints related to surface area on smaller aircrafts are lifted. It is therefore much easier to offer our client a comfort comparable to that of a yacht or a house.”



The Alberto Pinto-designed 747 could easily be mistaken for a yacht. Photo: Courtesy of Alberto Pinto Interior Design

And there's another private use for the 747 that will likely continue for some years to come: as the president's ride as Air Force One. “Air Force One is always the biggest and best airplane America can build, and that's why it'll be a 747,” says Oakley.

Even as the 747 reaches its twilight years, there's no question that aviation lovers will continue to regard it as the finest plane ever built. “It has an extraordinary presence,” says Foster. “I suppose it's the grandeur, the scale; it's heroic, it's also pure sculpture...I suspect it is one of those icons of the late-20th century that future generations will still look on in wonder.”