This was the future – a transatlantic Comet 4 in classic BOAC livery, 1959.

Come fly with me

THE WORLD'S FIRST JET AIRLINER WAS A REVOLUTIONARY BRITISH AIRCRAFT – AND AHEAD OF ITS TIME IN MORE WAYS THAN ONE

Words • Brendan Lewis

In September 1958, after five weeks at number one in the United States, Frank Sinatra's latest album reached number two in the UK charts. The singer hated the album's cover – he said it looked like a TWA advert. But with its songs of foreign travel and romance in exotic locations, *Come Fly With Me* was in tune with the intoxicating optimism of the age.

The airships that cruised serenely across the Atlantic in the roaring Twenties, and the luxurious flying boats that succeeded them, were a distant, pre-war memory. The doughty propliners of the 1940s were about to take their place in history. A new chapter in air travel began on 4 October, when the first jet passenger services crossed the Atlantic. Two airliners, resplendent in the classic British Overseas Airways Corporation livery of blue, white and silver, flashed past each other at 35,000ft over open ocean, bound for New York and London, flying so fast that they were starting to descend before their competitors were half way across. In the westbound jet, the airline's chairman exchanged congratulatory radio messages with his managing director, heading east.

The aircraft were de Havilland Comet 4s, and their passengers were enjoying a historic slice of the high life. Up there where, Sinatra sang, "the air is rarefied", 'Deluxe' sleeper seats cost £173 one-way, while a first-class ticket was £155. There was no economy class – it wasn't just the air that was rarefied. ➤➤

The image of luxury and sophistication: an early advertising shot for BOAC's transatlantic service.

Below: the world's first jet passenger service, London-Johannesburg, 1952. Bottom: adding the final touches to the prototype.

"Most senior British planners were hung up on a pre-War idea of exclusive, luxury air travel – but in the US, huge internal distances created a mass demand"

The British-built Comet was the queen of the skies. The world's first jet airliner was a technological wonder, half a decade ahead of its nearest rival when it first took to the air, soon after the end of World War 2. State-owned BOAC began services in 1952, and the aircraft clocked up record after record. The airline's jet network stretched across Africa and Asia, and now, the latest long-range version of the Comet had linked the old world and the new. This was the true dawn of the jet age.

But it had not been a faultless reign. And by 1958 it was under threat from a new, American pretender to the throne.

Let's fly, let's fly away

The post-war growth in air travel had been foreseen. But while UK aircraft builders were fully occupied during WW2 producing fighters and bombers, American companies were also building transport aircraft by the thousand. It's a short step from military transport to airliner, and the British realised that if they were to have any chance of grabbing a share of the post-war airliner market, they would have to plan.

The committee set up in late 1942 by the Churchill government was chaired by the minister of aircraft production, Lord Brabazon of Tara, who in earlier life had been a pioneer aviator, holder of Royal Aero Club Pilot's Certificate No. 1 and, in 1909, the first man to take a pig up in an aeroplane.

That pigs might fly could have been the committee's motto. While some of its recommendations resulted in successful small airliners, it is best remembered for the eight-engined Bristol Brabazon, a leviathan comparable in size to the 400-seat Boeing 747 of two decades later. Even if it had been a technical success – only one was completed, which never saw service – it might have been tricky to make a profit on a proposed long-haul capacity of just 50 reclining sleeper seats. "Most senior British planners were hung up on a pre-War idea of exclusive, luxury air travel," explains Michael Oakey of *Aeroplane* magazine. "But in the US, the country's huge internal distances created a mass demand."

Technologically, though, the British aircraft industry was avowedly forward-looking. Frank Whittle's turbojet had first spooled up in 1937. By 1941 both Rolls-Royce and de Havilland had jet engines under development. Gloster had been tasked with producing the first experimental British jet aircraft, and by the time the Brabazon committee first sat in February 1943, both Gloster and de Havilland had jet fighters almost ready to fly.

But jets were still an unknown. They used a lot of fuel, and no-one was sure that a large passenger jet could be commercially viable. Only one jet aircraft was proposed by the Brabazon committee – a 'fast transatlantic mailplane' ➳

To a cash-strapped country kept afloat by Marshall aid, the silver prototype looked like something out of Dan Dare when it rolled out in April 1949 – although Dan Dare hadn't been created yet. The big news on the roads was the Morris Minor

that might also have seats for a few VIP passengers. After further discussion, this evolved into a 14-seat, twin-engine airliner. To help things along, the Ministry of Supply ordered a batch for BOAC, and in February 1945 de Havilland was given the contract to produce it.

That de Havilland's jet experience at this point amounted to one tiny single-engined fighter design makes its enthusiasm for the project all the more surprising. The company had built small airliners before the war, but there was nothing approaching the Brabazon specification on drawing boards at the time, at de Havilland or anywhere else.

We'll float down in the blue

Work began under chief designer R.E. Bishop. A trip to Germany after the war convinced him of the need for swept wings. Radical shapes were considered and rejected. The final form of the Comet prototype was set by the end of 1946, with four de Havilland Ghost engines – the first in the world certified for passenger transport – a pressurised fuselage, modest wing sweep of 20 degrees, and 36 seats in nine rows of four. Construction took place in great secrecy at de Havilland's headquarters in Hatfield. "It was a pioneering company," says Mike Ramsden, a Hatfield apprentice during the 1940s. "Technically, we were making the pace."

To a cash-strapped country kept afloat by Marshall aid, where the big news on the road was the split-screen Morris Minor, the streamlined, silver Comet prototype looked like something out of Dan Dare when it rolled out in April 1949 – although Dan Dare hadn't been created yet.

"I'd been working on the Comet and the Comet testing," recalls Ramsden, who went on to become editor of *Flight International*. "It was something we all felt we belonged to – and it belonged to us. We were very proud of it." On 27 July, all the aviation correspondents were invited to witness the first flight, with John Cunningham at the controls. But it did not take place until the evening, after they had all gone home. "It wasn't the greatest PR coup," chuckles Ramsden. "Our public relations manager had been under pressure to say when it was going to fly, and he said, 'The aeroplane will fly when John Cunningham is ready to fly it. I don't think it will be today'."

The ex-RAF night-fighter ace and his crew of four took the Comet up to 8,000ft on a 31-minute flight, before making a low pass over the airfield for the benefit of the factory hands, and Sir Geoffrey de Havilland in his Morris Minor. He pronounced the new airliner to be "very promising so far".

We'll just glide, starry eyed

In America, the big news was the Lockheed Constellation. It was elegant and efficient – and could seat 81 passengers – but it cruised at just 270 knots, down at 25,000ft. It was no Comet. Neither was the new Douglas DC-6. These aircraft were the descendants of military transports, with powerful radial engines swinging huge three-bladed propellers. Their builders had done well out of the war, but it was Boeing, a bomber specialist, that was to move American transport aircraft into the jet age. The six-engined B-47 was capable of

Test pilot John Cunningham checks the prototype before the first flight, July 1949.

Below: the four-man crew in the cockpit during an early test flight.

carrying 11 tons of bombs at over 500 knots. It first flew in December 1947, and Boeing went on to build more than 2,000 of them. It was bigger in every dimension than the early Comets, and faster, and could carry almost twice the payload. When Boeing finally got around to developing a jet airliner as a private venture, this Cold Warrior and its successor, the mighty B-52, had already paved the way.

But with Strategic Air Command as a customer, it was years before Boeing even started sketching a jet passenger aircraft. The Comet had the world at its feet. Well-heeled passengers cruised the skies in high-altitude comfort at 500mph. In addition to the BOAC's ten Comet 1s, de Havilland had received another ten export orders for the 44-seat Mk 1A. Plans were in hand for the Comet 2, with more powerful Rolls-Royce engines, a greater fuel load and longer range. Orders had been taken for 35. And the stretched Mark 3, with 78 seats and a transcontinental range, had attracted serious interest from the ultimate export customer – Pan Am itself.

The Comet was flying high.

Down to Acapulco Bay

But only one Comet 3 was ever built. The Comet 2s never reached their overseas customers. Two Comet 1s exploded over the Mediterranean in early 1954, and the entire fleet was grounded. The Royal Navy dredged up debris while the Royal Aircraft Establishment at Farnborough carried out the most exhaustive accident investigation ever undertaken, reassembling the recovered pieces into a giant three- ➤

The Comet 1 assembly line at Hatfield, with Vampire jet fighter production in the background.

PHOTO AEROPLANE MAGAZINE/CORBIS

A Comet 4C of Middle East Airlines over Beirut. The airline operated between Bombay and London. Below: a BOAC publicity photo.

dimensional jigsaw puzzle, and pressure-testing a complete Comet airframe to destruction.

It was a black period for de Havilland. "Morale was low," admits Mike Ramsden. "But the company was determined to make the Comet a success. The predominant feeling was that we had to redeem the aircraft and ourselves, and this was supported not only by the airline but by the Royal Aircraft Establishment and by the government. It was a national determination really."

The eventual diagnosis was metal fatigue, caused by repeated pressurisation of the fuselage. The Comet has been described as the most rigorously tested airliner in history, and metal fatigue had been an acknowledged and thoroughly investigated risk during the design. But the stresses around cut-outs in the fuselage – windows and hatches – had not been fully understood. Fatigue cracks led to catastrophe.

De Havilland was absolved of blame. The investigation found no fundamental fault with the company's design, testing and construction regime: "I do not think that they can justly be criticised," wrote the commissioner of the enquiry. "De Havilland were proceeding in accordance with what was then regarded as good engineering practice." It seemed that the Comet was ahead of its time in more ways than one.

"We had to redeem the aircraft, and this was supported by the airline, by the RAE and by the government"

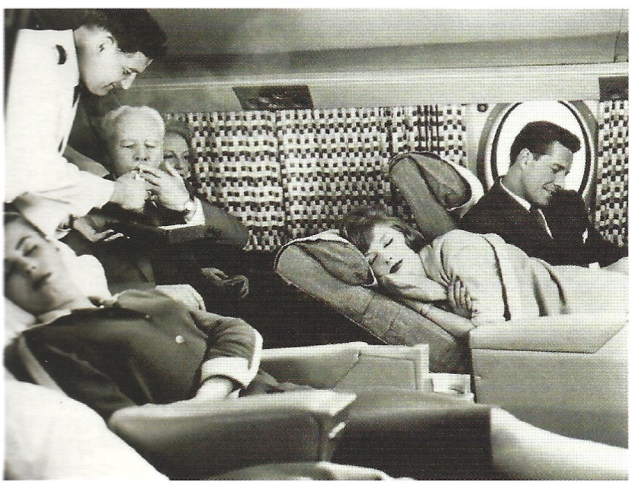
There's a bar in far Bombay

Meanwhile, Boeing had test flown their 367-80 – precursor to the 179-seat 707. "The 707 ordered by PanAm was hard behind the Comet," says Ramsden. "A rivalry developed between the two aircraft – and indeed between the two countries – to be first on the Atlantic route with jets. There was a feeling that we'd got to win this one."

The Comet 4 – the larger, long-range, high capacity version that BOAC wanted for the transatlantic route – was finally announced in 1956, but by then Pan Am had already ordered 20 of the big Boeing 707s, and 25 of its even bigger rival, the Douglas DC-8. A technological lead of years evaporated as, three weeks after the silver Comets blazed their transatlantic trail, Pan Am began its own jet services, with longer-range Boeing 707s. The first flight, to Paris, carried 111 passengers – the most fare-paying customers ever to board an airliner. Each paid the equivalent of £97 for a one-way 'coach'-class ticket.

If the Comet showed how futuristic air travel could be, it was the 707 that mapped out the future of air travel. The Mark 4 Comet was too late, and – literally – too little. In 1959 BOAC ordered Boeing 707s.

De Havilland's magnificent, flawed, silver machine may have been, in the words of its test pilot, "one of the most significant aeroplanes in the entire history of commercial air transport". And it was. But being first across the Atlantic was a final flourish. After that, if you felt you could use some exotic booze in that bar in far Bombay, you were probably going by Boeing.



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Datafile – de Havilland Comet vs Boeing 707

	DE HAVILLAND COMET 1	DE HAVILLAND COMET 4	BOEING 707-120
Length	93ft 0in (28.35m)	111ft 6in (33.99m)	144ft 6in (44.04m)
Wingspan	115ft 0in (35.05m)	114ft 10in (35.00m)	130ft 10in (39.88m)
Wing area	2,015ft² (187.2m²)	2,121ft² (197m²)	2,433ft² (226m²)
Height	28ft 4in (8.65m)	29ft 6in (8.99m)	42ft 0in (12.80m)
Seats	Typically 36; max 44	Typically 60-81; max 106	110 in two classes; max 179
Engines	4 x 5,050lb DH Ghost Mk50-1 turbojets	4 x 10,500lb RR Avon Mk 524 turbojets	4 x 13,500lb P&W JT3C-6
Max takeoff weight	107,000lb (48,535kg)	158,000lb (71,700kg)	257,000lb (116,575kg)
Max cruise	429 knots (788km/h)	457 knots (846km/h)	496 knots (919km/h)
Service ceiling	35,000ft (10,668m)	42,000ft (12,800m)	31,500ft (9,600m)
Max payload range	1,520nm (2,816km)	2,366nm (4,382km)	2,670nm (4945km)
First flight	27.7.49	27.4.58	20.12.57
First commercial flight	2.5.52	4.10.58	26.10.58
No built (all versions)	114	114	856