

SIR GEOFFREY DE HAVILLAND, AEROSPACE PIONEER

A portrait of the achievements and challenges of one the most innovative aircraft designers of the twentieth century.



From the beginning of the 20th century until the commercial jet age the designs of Sir Geoffrey de Havilland have amazed the flying community by setting milestones in the evolution of flight. His designs, shaped by two world wars and the upcoming of the jet engine, have left its mark on aviation history. Here a brief insight in his life and some of his greatest achievements and challenges will be portrayed.

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DISCOVERING FLIGHT

Born 27 July 1882 as a son of a reverend in Buckinghamshire, Geoffrey de Havilland attended engineering school in Oxford as well as the Crystal Palace School of Engineering and spent his first professional years as a draughtsman in the automotive industry. However his enthusiasm for airplanes motivated him to leave his job and start constructing his own aircraft. While his first aircraft crashed on its maiden flight the second was already successful in establishing a new British altitude record (10,500 feet) and became the first aircraft of this type to be purchased by the British government.

This success allowed him to work for the HM Balloon factory at Farnborough in 1910, which was to become the Royal Aircraft Factory, where he increased his knowledge on aircraft design through various experimental aircraft. Three years

later he was hired as chief designer for Airco (short for Aircraft Company) in Hendon, where he designed aircraft throughout the First World War, all bearing his initials "DH" in front of their name.

These designs included the DH-4 single engine bomber which was a huge success. Due to its high reliability and impressive performance it is considered the best single engine bomber of the First World War.

DH-4: DE HAVILLAND'S FIRST MAJOR SUCCESS

The Airco-DH4 (figure 1) was a two seat biplane day bomber entering service in March 1917. It was an all wooden construction biplane accommodating two crew members consisting of the pilot and an observer armed with a moveable Lewis machine gun for self-defence. Powered by the Eagle VIII (375 hp) it could

outperform almost all fighters and was highly manoeuvrable. Its main success came from its speed, range and ability to defend itself, making it one of the most successful aircraft of its type during the First World War. It continued to be used on large scale after the war with a total number of 1449 in the UK and another 9,500 in the United States of which 1885 aircraft reached France during the war.

DE HAVILLAND AIRCRAFT COMPANY

In 1920 Geoffrey de Havilland started on his own, forming the De Havilland Aircraft Company where he acted as CEO, chief designer and occasional test pilot.

In the first years with his own company de Havilland focused on continuing his family of DH aircraft for civil purposes which resulted in the highly successful "Moth" family, a number of biplane aircraft for various purposes which were powered



Figure 1. The de Havilland DH 4



Figure 2. The famous de Havilland Mosquito

by engines made by the De Havilland factory themselves because Sir Geoffrey was dissatisfied by the engines currently available.

COMET RACER

In 1934 de Havilland proved again to be an innovator when his Comet Racer won the MacRobertson Air Race, racing from London to Melbourne (Australia), beating the highly favoured American DC-2. The red Comet Racer was designed in a highly streamlined form during the era when boxy biplanes were still common, being almost ten years ahead of its time. Powered by two Gipsy Six engines and variable pitch propellers the Comet could fly at a speed of 320 kilometres per hour having also enough power to be able to maintain altitude with just one engine. This proved to be very fortunate in the end of the race when one of the engines suffered from low oil pressure and had to be shut down. The last two legs could now still be continued with one engine throttled down and occasionally even completely single engined.

THE MOSQUITO

During the Second World War de Havilland adapted his designs to Britain's strategic needs, its shortage on aluminium and metal workers. Endlessly resourceful he constructed one of the most outstanding aircraft of the Second World War, the Mosquito, build of plywood by carpenters and piano makers. Using his design team from the Comet Racer he sank all his knowledge about high speed propeller aircraft into the Mosquito (figure 2). Powered by two Rolls Royce Merlin 21 engines it became the fastest airplane of its time, flying more than 600 kilometres per hour. It soon got a name as the most versatile aircraft of the Royal Air Force. Used not only for its initial purpose as high speed bomber but also for a variety of other roles, ranging from night-fighter to ground-attack or reconnaissance. Apart from its excellent performance, the rela-

tive simplicity in production of the aircraft led a total production of 7781 aircraft produced of which 6710 were built and operated during the war.

EARLY JET FLIGHT

With the upcoming of the jet age de Havilland also took the lead, simplifying Sir Frank Whittle's jet engine to the more practical and very successful Goblin engine which he used to power the Vampire fighter in 1943, one of the first jet fighters to be produced in large numbers. It continued to be used by air forces of various countries until decades after the Second World War.

Even after the Second World War de Havilland continued to be on the leading edge of design, continuously pioneering in unknown technologies. His response to the upcoming question about the sound barrier led to the construction of the DH 108 Swallow, a tailless experimental jet aircraft designed for the purpose of breaking the sound barrier. They succeeded in 1948 less than a year after the American success with Chuck Yeager in his rocket powered Bell X-1. This undertaking however paid a dramatic price to Sir Geoffrey de Havilland: during one of the test flights one of the DH108's broke up in transonic flight, killing the test pilot, his son Geoffrey de Havilland Jr.

COMMERCIAL JET FLIGHT

In 1949 de Havilland built the world's first jet airliner, the de Havilland Comet (figure 3), which was immediately loved by

its passengers. Its popularity came from being able to fly almost twice as fast as its piston engine counterparts, free from vibrations at an altitude which avoided the discomforts of the weather. Its initial commercial success however vanished after multiple accidents occurred due to a later discovered, until then unknown type of structural weakness, metal fatigue. Although the Comet was never again a commercial success after structure had been improved, it stood for the birth of commercial jet aviation and many discoveries made during its time still shape the design of modern jet airliners today.

After the Comet Sir Geoffrey also pioneered with long range missiles leading to the development of the liquid-fuelled Blue Streak missile which later became the first stage of the Europa rocket, a launch vehicle used in space flight.

De Havilland continued his work at the De Havilland Aircraft Company until his retirement from designing in 1955 continuing only as president. Never having lost his passion for flight he kept flying into his 70's until he died at the age of 82 due to cerebral haemorrhage on May 21 in 1965 in Hertfordshire.

Sir Geoffrey de Havilland was knighted in 1944, having pioneered in aviation from its first days until the 1950's and being well ahead of the rest during two world wars. ✈



Figure 3. The de Havilland Comet

References

<http://www.allstar.fiu.edu/aero/havilland.htm>

<http://www.aviation-history.com/de-havilland/mosquito.html>

<http://www.centennialofflight.gov/essay/Aerospace/DeHavilland/Aero49.htm>