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INTRODUCTION

It was an exciting day for schoolboy Robin Brettle, and the highlight of a project he was doing on test flying: he had been granted an interview with John Cunningham. Accompanied by his father, Ray, Robin knocked on the door of *Canley*, Cunningham's home at Harpenden in Hertfordshire and, after the usual pleasantries were exchanged, Ray set up the tape recorder and Robin began his interview. He asked the kind of questions a schoolboy might be expected to ask, and his father helped out with a few more specific queries.

As the interview drew to a close, Robin plucked up courage to ask a more personal question: 'Were you ever scared when flying?'

Thinking that Cunningham would recall some life-or-death moments when under fire from enemy aircraft during nightfighting operations, father and son were very surprised at the immediate and direct answer: 'Yes, every time I flew the DH108.'

Cunningham, always calm, resolute and courageous in his years as chief test pilot of de Havilland, was rarely one to display his emotions, but where this aircraft was concerned he had very strong feelings, and there were times during the 160 or so flights he made in the DH108 that he feared for his life - and on one occasion came close to losing it. He was not alone, for all three prototypes of this extraordinary and charismatic experimental aircraft were eventually lost in fatal crashes, one of them taking the life of Geoffrey Raoul de Havilland, eldest son of the company's founder. That is the tragedy of the 108 - but there were more than 500 flights in which it did not crash, and in those flights a huge amount was learned about the high and low speed behaviour of swept-back wings and trying to manage without a tailplane.

More than any other British aircraft in the immediate post-war years, the DH108 typified the brave and imaginative steps of discovery into the dangerous and uncertain regions of transonic flight. With its sharply swept wings and fin it was beautiful and futuristic, and with no tailplane it looked positively startling. Although it is remembered primarily as the first British aircraft to fly faster than sound, it was much more than that. The world's first swept-wing tailless turbojet to fly successfully and the most important British research aircraft of its time, it had a chequered career of triumphs and disasters, but never failed to create excitement wherever it went, and did much to galvanise an aviation industry trying

to move forward after the ravages and deprivations of the war years - especially as the test programme at Hatfield and, latterly, Farnborough was carried out by names that read like a *Who's Who* of famous British test pilots. It was the only aircraft we had at the time that could conduct true high speed research, so its progress, whether triumphant or tragic, was always closely followed - not only by the industry in general, but by a public fascinated by its elegant and unusual appearance. It was described in the 15 April 1948 issue of *Flight* as 'one of the world's most remarkable aircraft.'

Yet the DH108, and its first supersonic flight, were so typically British, and in sharp contrast to America's successful no-holds-barred attack on the barrier. At the time it really was seen as a barrier, for there were many eminent aerodynamicists who believed it would not be possible to fly faster than sound.

But America was determined. Their rocket-powered Bell X-1 was designed specifically for that purpose, achieved it in level flight, and was almost certainly aided by our ridiculous generosity in handing them all the data from the cancelled Miles M52 - including that vital component, the all-moving tailplane. Britain, meanwhile, cobbled together an inherently unstable tailless design by taking a Vampire fuselage and bolting a pair of swept wings onto it. With the limited know-how and primitive technology available, combined with the low thrust of early jet engines, it is remarkable that this little aircraft and its brave pilots achieved so much, for it was never designed to be supersonic, but rather as a small scale testbed for the world's first jet airliner, the Comet - which, in the end, looked nothing like the 108.

As for our first supersonic flight, it happened almost by accident in a wild bucking bronco dive in which the aircraft developed a mind of its own - to the dismay of the courageous pilot - and a very brutal mind, at that.

So far so British - and yet surely our efforts were the more laudable: we didn't have wide open spaces, we didn't have a mother ship to carry us to a great height, we didn't have room to make mistakes, and we didn't have much money - no, we did it on a tight budget with a low-powered jet that took off and landed under its own power, and consequent weight of fuel. Even the Americans were quick to admit it was a very significant achievement.

I developed a special interest in the 108 when researching the biography of John Derry in 1980 and learned a lot about the courage and determination displayed by him and its other pilots. With the publication in 2008 of the second edition of *John Derry - The Story of Britain's First Supersonic Pilot*, I was determined to find out more and present the full story of this fascinating but deadly aircraft and, equally importantly, the men who flew it.

And what an extraordinary saga I uncovered; one of excitement and disaster - but, above all, a tale of bravery and endeavour, from the design team and the unsung backroom boys

to the test pilots who risked their lives, and in three instances lost them. Some of the flights in this aircraft were frightening almost beyond belief, and in today's safer industry where computers and simulators provide many of the answers, would be unthinkable. Yet not all of those alarming experiences were at high speed. Small wonder that the famous Eric Brown, who headed Aero Flight at Farnborough, described this little aircraft as 'a killer'.

A great deal of documentation on the 108 project still exists in the BAE Systems archives at Farnborough and the National Archives at Kew, with files giving details of early meetings, wind tunnel tests, graphs, calculations, flight reports and accident investigations.

One of the most fascinating documents came to light through Bruce Gordon, of the de Havilland Heritage Centre at London Colney, who kindly loaned me the *DH108 Flight Test Diary and Shop Log*, which is the original and faithful record of the aircraft's activities from April 1946 until February 1948. Details of every flight, from the first runway hops, together with all maintenance, servicing, and prevailing weather conditions, were entered meticulously each day in pencil and ink. That book is a wonderful piece of aviation history and, unlike today's impersonal computerised records, has the human touch all over it.

Equally valuable has been access to most of John Derry's flight reports relating to his exacting and dangerous work on the high speed programme. These were compiled in the early 1990s, along with other data and flight chronology, by former de Havilland test pilot John Wilson.

But this is more than the story of the DH108: it is a human story of de Havilland and a story of a golden age of exploration. To put this unique aircraft into context, I have included a brief history of de Havilland the man and de Havilland the company, a look at some of the tailless designs in the first half of the 20th Century - in particular the Messerschmitt Me163 - the structural and aerodynamic complexities of swept-back wings as a means to higher speeds, plus a short study of the Miles M52, which might have been supersonic, and the Bell X-1, which was.

The men who undertook the major part of the flight test programme in the DH108 were among the leading test pilots of that era: Geoffrey Raoul de Havilland, John Cunningham and John Derry. Outstanding men, all three, but with very different personalities. Their lives and characters are an intrinsic part of this story.

Then there are the three tragic accidents. Geoffrey's death when the second prototype disintegrated at high speed over the Thames Estuary shocked the nation, and the accident investigation revealed some of the extreme dangers that lay in wait at the borders of the speed of sound - but which, nevertheless, still had to be explored by man and machine. I hope, too, that I have done justice to the other two pilots who lost their lives in the remaining

prototypes: Stuart Muller-Rowland and Eric Genders have generally merited little more than a mention in magazine articles over the years, appearing almost as also-rans, but in fact they were exceptionally skilled, brave and determined young men, decent young men with distinguished war records, who felt privileged and excited to be at the forefront of British aeronautical research. Sadly, their time with the DH108 was pitifully short.

There is no escaping the fact that death stalks the chapters of this story, culminating in the tragic loss of John Derry at Farnborough in 1952. This terrible accident had a deep and lasting effect on many of us. As a schoolboy aged 10, I was one. Test pilots were our heroes in those days - and worthy heroes at that. Derry was one of mine, along with Neville Duke and Mike Lithgow, and even in death he has continued to play a significant role in my life.

A particularly heart-warming aspect of my research has been meeting some of the de Havilland personnel involved in the 108 project. The company always had a reputation of having a strong family feel about it, and that is still evident more than 60 years later among those I spoke to and who gave me so much help; men such as John Wimpenny and David Newman from the aerodynamics department, Wilf Joyce, Ken Bonney and Doug Watt from the drawing office, and test pilot John Wilson.

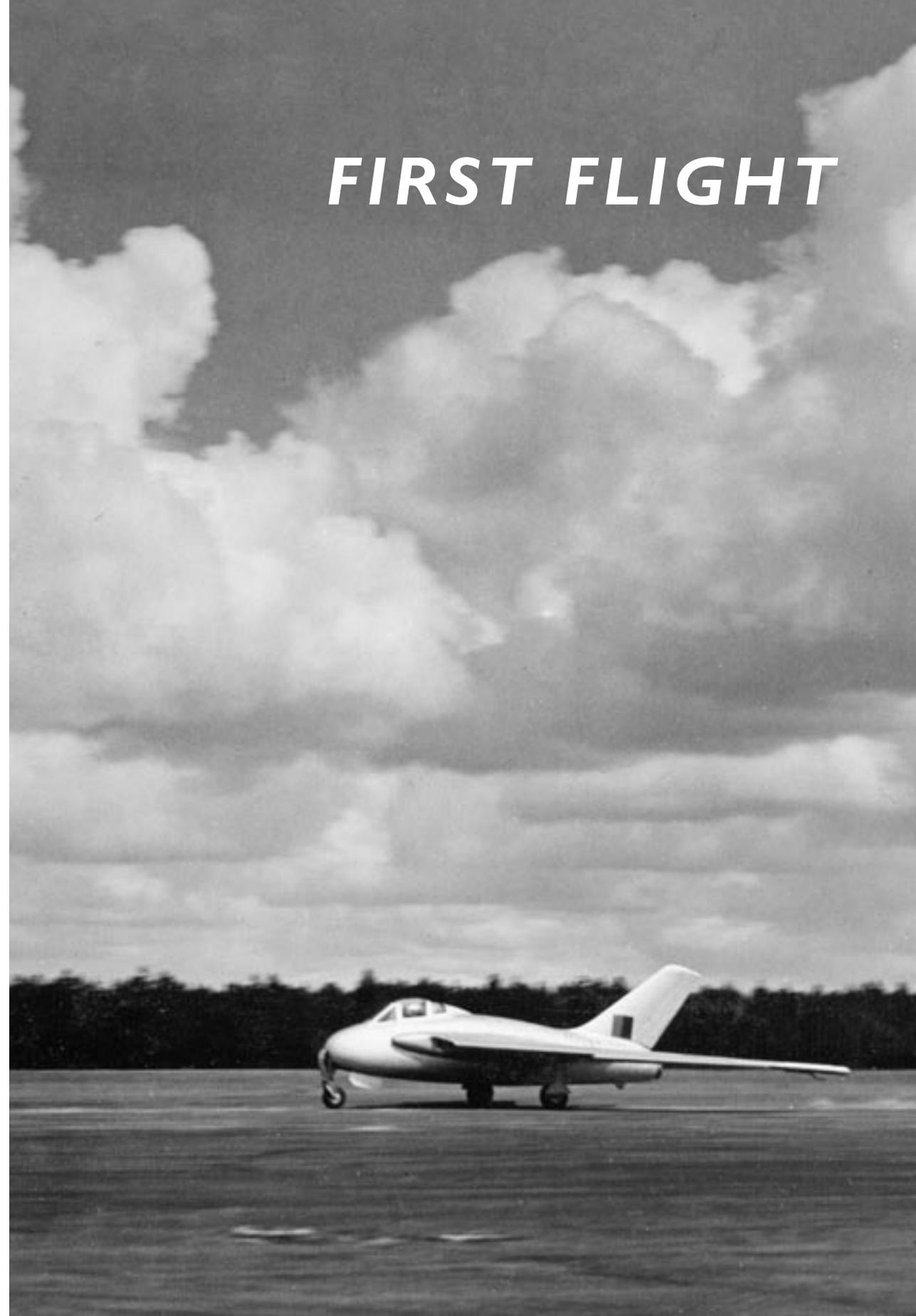
The early years of transonic research were extremely hazardous, and lives were lost, but it was a most exhilarating period in aviation. It was the best of times, and on occasions the worst of times, but all of those who worked at de Havilland in the war years and immediately afterwards look back on that era as the most memorable of their lives.

This is the story of the most exciting and adventurous experimental aircraft from that period and the men who flew it into the unknown.

BRIAN RIVAS

Opposite Page: On the landing approach: Geoffrey de Havilland Jr brings TG/283 in at the end of the maiden flight. BAE SYSTEMS

FIRST FLIGHT



Chapter 1

FIRST FLIGHT

WEDNESDAY 15 MAY 1946

Surely this was it. Yesterday it had been the weather, the day before it had been mechanical problems - but this morning, as the first light of day began to creep over the dense pine forest surrounding the airfield, things were looking good: the clear dawn sky held the promise of some fine spring weather, and there seemed nothing to stand in the way of Britain's most secret experimental aircraft taking to the air for the first time.

It had been a restless night for most of the ground crew, although mulling over the chances of the first flight was not necessarily the reason, for only the soundest sleeper could have hoped for peace in this place, even though it was deep in the countryside and several miles from the nearest town.

As fate would have it, blind flying trials were being carried out at night in an Avro Lancaster. Quartered in their spartan hut uncomfortably close to the runway, the fitters, woodworkers and engineers were treated nightly to the deafening roar of four Merlin engines at full bore on the take-off run, and just when they were dropping off to sleep again the aircraft would land and the whole performance would be repeated. These were not the most comfortable nights they had spent, but fortunately it was likely to be for only a short period - just those crucial first flights - for Woodbridge airfield had great advantages when it came to testing a radical and untried design such as this, especially one that already carried ominous warnings and uncertainties about its handling.

Built in Suffolk in 1942 as one of three emergency east coast landing strips for stricken bombers returning from night raids over Germany, the airfield had a 3,200yds runway that was 250yds wide with generous grass undershoot and overshoot areas of 500 and 1,000yds respectively. This gave a huge safety margin for bombers landing with flak-damaged airframes or engine trouble, but it offered the same benefits should anything go wrong on the first flight of an untried prototype. Another bonus was the fact that the airfield was located deep within a coniferous forest, which meant that anything of a secret nature was kept well away from the eyes of the curious. However, it wasn't so easy to keep it hidden from prying eyes in the air, and word soon spread among the pilots of 56 Squadron at nearby

RAF Bentwaters that de Havilland were preparing to test fly a secret jet, so they made a point of flying low over Woodbridge whenever they could in the hope of catching a glimpse of the machine.

Although usually kept well hidden, on the rare occasions that it was spotted on the ground it caused great excitement and speculation among the pilots, for it was a startling sight: a short, dumpy fuselage with sharply swept wings and a swept fin. That was all: no rear fuselage and no tailplane, and even on the ground it looked clean, fast, and futuristic, making their Meteor IIIs appear lumbering and ungainly by comparison.

What they had glimpsed was the de Havilland DH108, which was to become the world's first swept-wing tailless turbojet aircraft to fly successfully.

Jokingly, they later issued a challenge to race the little aircraft, for they got on well with the Woodbridge crew, but they might have been surprised to find that, had the challenge been taken up, they would easily have beaten it, for this particular prototype was designed solely to explore the low speed handling of the tailless swept-wing concept and was limited to a top speed of 350mph. A high speed version would come a few months later.

The DH108 had been designed and built in the top-secret Experimental Department at de Havilland's headquarters at Hatfield, but the Hertfordshire airfield had no hard surface runway at the time, although work was about to start on one, as well as a perimeter track. However, as there were so many unknown factors surrounding the aircraft it had already been decided that, regardless of the Hatfield runway status, after construction was complete it would be dismantled and taken by road to the remote and safer location of Woodbridge, there to be reassembled for initial flight testing.

Although bearing an obvious resemblance to the German wartime rocket-powered Messerschmitt Me163B, the British creation had much more sharply swept wings and it was known from the outset that the handling of such an unusual design would be different from a conventional layout, particularly in respect of stability, for it combined the untested format of highly swept wings with the inherently unstable configuration of a tailless fuselage. To get some firm ideas of what to expect, de Havilland had asked the Royal Aircraft Establishment (RAE) at Farnborough in Hampshire to carry out wind tunnel tests. Farnborough warned that they could expect something rather unpleasant, particularly at low speeds, with Dutch rolling that could lead to a wing dropping and then a spin from which it would be very difficult, if not impossible, to recover.

The Dutch roll is so-called because it is supposed to resemble the traditional fat Dutch sailor waddling along the quayside. Ironically, it is made worse by the directional stability of swept wings. If a swept-wing aircraft yaws, the forward-moving wing presents a larger

frontal area and thus more drag, with the result that the other wing then moves forward, at the same time creating more lift, and the result is a self-perpetuating, uncomfortable wallowing motion combining yawing and rolling that at low speeds can lead to loss of aileron control and wing-drop.

Farnborough's predictions were worrying and the precaution was taken of fitting anti-spin parachutes in wing-tip cylinders, but before the trip to Suffolk and following roll-out from the workshops, there was the opportunity to spend a day doing some preliminary tests at Hatfield to get the feel of the machine in some fast ground runs.

Based on Farnborough's predictions and their own calculations, the Aerodynamics Department at de Havilland issued a pilot's guide on 15 March 1946 detailing the expected handling characteristics of the aircraft. This included take-off technique and climb-out with suggested control surface settings, and a strong recommendation that for the first flights when near the ground the aircraft should always be flown 15 to 20mph above stalling speed.

The take-off run was expected to be much longer than that of the de Havilland Vampire: with an all-up weight of 7,500lb for early flights, the estimate was 495yds against the heavier Vampire's 324yds, and at the maximum normal weight of 8,300lb (still 200lb below the Vampire) the 108 would use up 620yds of runway - almost twice as much as the heavier machine.

The guide warned that because the fin was mounted on the short fuselage just behind the wings, it would give poor directional 'weathercock' stability and this, coupled with the characteristics of swept wings, would mean that any yaw at low speed would tend to produce a lot of roll with increasing directional and lateral oscillation - Dutch rolling - and would feel similar to a tailed aircraft with too much dihedral and too small a fin. However, it was felt this would be unpleasant rather than dangerous and should not be too difficult to control, pointing out that greater co-ordination of rudder and aileron than on a normal aircraft would be needed.

The notes added that deliberate spinning was of no practical importance on the 108, and de Havilland did not think a spin was likely to occur if the machine was handled according to their recommendations. 'In any case, you have anti-spin 'chutes,' they concluded comfortingly. But during the test programme operational failures with these 'chutes were to bring anything but comfort.

On Sunday 28 April 1946, the first DH108 prototype, bearing the registration TG/283, was rolled out of the Experimental Department hangar. Later in the day the company's chief test pilot, Geoffrey Raoul de Havilland, son of the company's founder, eased his tall frame into the cockpit. The general layout was quite familiar to him, as the fuselage was basically



Roll-out: the first DH108 prototype (TG/283) greets the world as it emerges from the Experimental Department hangar at Hatfield. Guiding the nosewheel is shop foreman Sid Parsons. BAE SYSTEMS

a Vampire with only some minor modifications. The power plant, too, was from the Vampire stable, being a Goblin 2 jet engine of 3,100lb static thrust designed and built by the de Havilland Engine Company. But the remainder of the 108 was unlike anything else: its sharply swept wings and fin gave it a diminutive bat-like appearance, and in its silver finish with RAF roundels and fin flashes, its elegant, streamlined shape looked like something from a boys' magazine.

With 100 gallons of fuel on board and an all-up weight of 7,750lb, TG/283 was prepared for taxiing tests and engine runs, watched by senior de Havilland staff and other members of the design team. The Goblin was run up with no problems, the familiar whistling-whine echoing across the airfield, and later in the day it was time for the first taxiing trials. These were observed by members of the project team, and the aircraft was recorded as being 'possibly airborne at 100 IAS' (indicated air speed). However, the wheel brakes were noted as being 'poor', although Geoffrey felt that the elevons (control surfaces that combine the function of aileron and elevator) seemed quite effective as elevators. What he



A 'wet start' during an early engine run on TG/283. The clouds of paraffin vapour are from unburned fuel following a previous failed attempt to start. BAE SYSTEMS

had experienced in those brief runs gave him some confidence for the first flight, but when the day's activities ended TG/283 was towed back to the workshops for dismantling in preparation for the 54-mile road trip to Woodbridge.

The crew wasted no time and on Monday they began to take the aircraft apart. By the afternoon of Friday 3 May they had it ready for the journey and it was loaded onto two 'Queen Marys'. These 60ft-long trailers, pulled on this occasion by Commer Q2 tractor units and accompanied by a maintenance lorry towing a fuel bowser, were produced by Taskers Trailers at their works in the little village of Anna Valley, just outside Andover in Hampshire, and were used extensively in the war for recovery work. Their extreme length often caused difficulties on narrower roads, but traffic just after the war was very light and the journey to Woodbridge, although slow, presented no serious obstacles.

The men made their preparations over the weekend for their stay in Suffolk, said goodbye to their families, and set off to spend what could be the next month or so - no one was quite sure how long - in accommodation rather less comfortable than that which they were

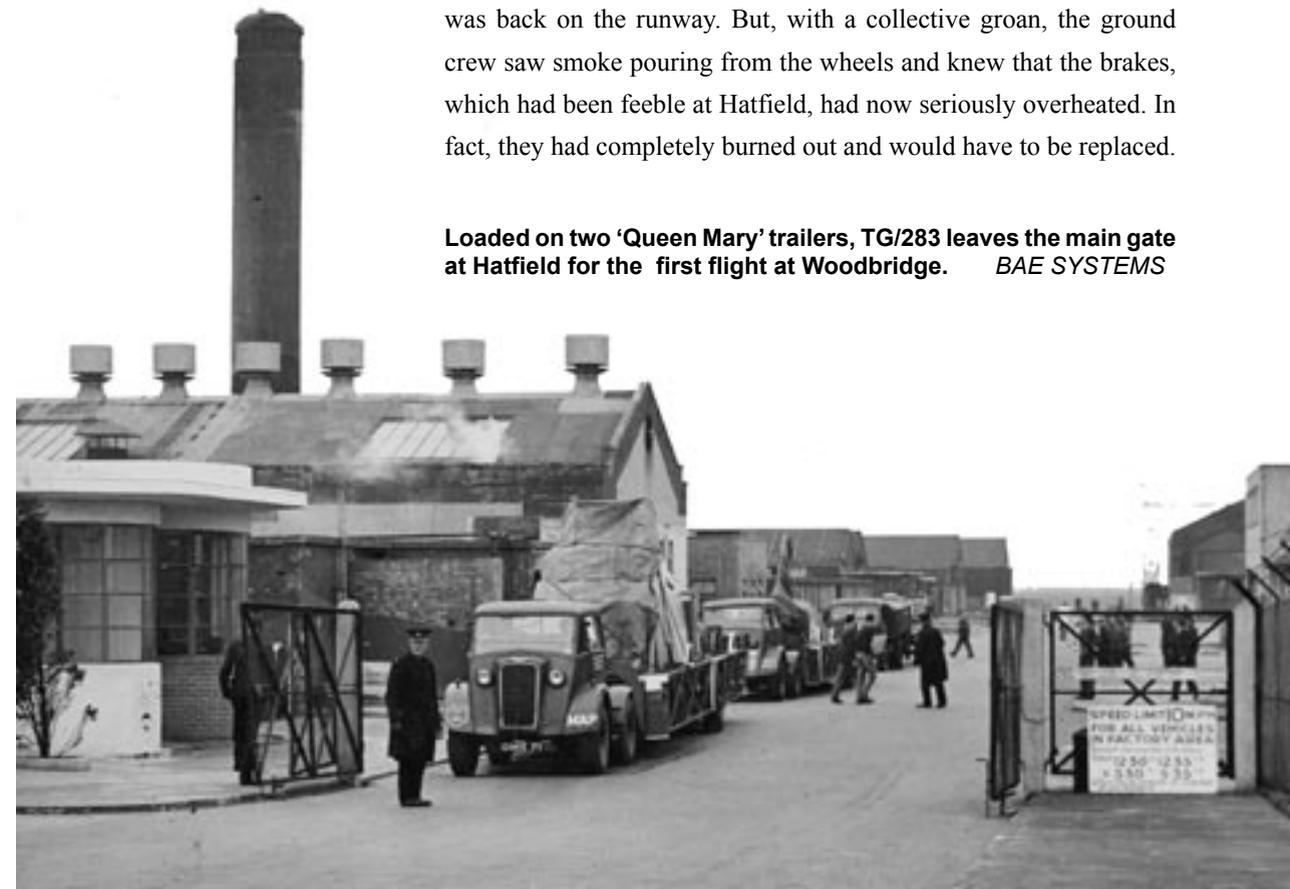
leaving. The whole trip took a great deal of organisation, for there was much in the way of ancillary equipment to accompany the 108. But once at Woodbridge the ground crew displayed their usual teamwork so that by the following Saturday TG/283 was assembled and ready for taxiing.

Once again, just 13 days after the first tentative trials, Geoffrey was back in the cockpit - but this time there was none of the restrictions of Hatfield, for he now had the freedom of a very long and wide runway.

The plan for Saturday 11 May was to carry out more taxiing and then a short hop. The weight of the aircraft remained the same at 7,750lb and the centre of gravity was set at a slightly rearward 0.22 AMC (aerodynamic mean chord) by adding some ballast to the tailcone. Lining up on the runway, and watched by the ground crew, Geoffrey opened the throttle, released the brakes and the low whine of the Goblin rose as the silver aircraft gathered speed until the nose lifted fractionally and the rumble of the nosewheel died abruptly. Now there was just the gentle drumming in the cockpit of the main wheels and seconds later that, too, went as the airspeed indicator read 120mph. TG/283 was airborne - but only for two or three seconds, as nothing more was intended. Geoffrey immediately

eased the throttle and applied the wheel brakes as soon as the machine was back on the runway. But, with a collective groan, the ground crew saw smoke pouring from the wheels and knew that the brakes, which had been feeble at Hatfield, had now seriously overheated. In fact, they had completely burned out and would have to be replaced.

Loaded on two 'Queen Mary' trailers, TG/283 leaves the main gate at Hatfield for the first flight at Woodbridge. BAE SYSTEMS





Start of the journey to Woodbridge: TG/283's starboard wing outside the de Havilland HQ, the building still in its drab wartime camouflage. BAE SYSTEMS

After some discussion it was decided to fit standard Vampire main legs in the fixed position for the next hop, and the crew worked throughout the night to have the 108 ready for more testing the next day. Geoffrey did two similar runs in the morning and TG/283 was easily airborne at 120mph - but the brakes were still overheating, so yet again new ones had to be fitted. This didn't take long, and in the afternoon three more hops were made, each of about 300yds and about five to ten feet off the ground. Geoffrey found that the aircraft was fine directionally and laterally, but there was some slight fore and aft unsteadiness, although he did not feel this was serious, and he was happy with the effectiveness of all the controls.

The day of the first true flight was near. On Monday 13 May the crew refitted the original undercarriage assembly and made a general inspection of the aircraft in readiness. By Tuesday it was cleared for flying - although this time it was not a mechanical issue but a strong crosswind that prevented any activity. And so there was a feeling that Wednesday would be a momentous day. The weather was perfect for flying; clear with sunshine and broken cloud.

During the day a variety of aircraft touched down at Woodbridge for the occasion, ferrying senior de Havilland personnel and the design team from Hatfield and nearby Leavesden. The Hatfield party included Sir Geoffrey de Havilland, along with chief designer Ronald E. Bishop and Major Frank B. Halford, chairman and technical director of the de Havilland Engine Company. They were flown in by Ian Fosset, a member of the sales team, in a DH104 Dove, an eight-seat light transport which had first flown in the previous year and

for which he was the sales demonstration pilot. Other personnel arrived in the graceful DH Dragon Rapide biplane, a twin-engined Airspeed Envoy, and even a sleek TK2, a racer built by the de Havilland Technical School.

Among the gathering were de Havilland test pilot Geoffrey 'Iser' Pike (so-named after his habit of often starting a sentence with the words 'I suggest'), sales director Francis E.N. St Barbe, chief aerodynamicist Richard M. Clarkson, company chairman Bob Harper, and Sir Geoffrey's younger son Peter de Havilland. They were soberly dressed, as was the norm in those days, in suits, ties, and overcoats or raincoats, with Clarkson, Bishop, and Sir Geoffrey sporting trilby hats. Sir Geoffrey, with his sharp but kindly face, cut an

With a ramshackle shelter behind them and a brazier for a bit of warmth, the ground crew look to be in good spirits at Woodbridge in May 1946. Some names have been lost over the years, but, standing, are: Bert Pocock, woodworker (second left); Alan Copas, hydraulics and systems (fifth left); Stan Hyner, fitter (sixth left); Fred Wale, inspector (first right); Sid Parsons, Experimental Department foreman (second right); Bob Robson, chargehand (fourth right); Frank 'Franko' Hemmings, hydraulics (fifth right, wearing scarf). Seated are Bob Seales, woodworker (first left); S.Hestor, woodworker (second left), and Harry Davies, inspector (fourth left). Also in the picture, but unidentified, are C.G.Green and J.English. BAE SYSTEMS





Watched by senior de Havilland staff and directors, TG/283 is fuelled-up at Woodbridge in preparation for the first flight. BAE SYSTEMS

authoritative figure, while Bishop's austere features looked as though they might encompass success and tragedy in equal measure. A brilliant but quiet man who hated publicity, he had seen both and he would see more. As would they all.

The ground crew made their final checks before Geoffrey, wearing light shirt and trousers with a short, dark jacket and dark tie, climbed into TG/283 for the first flight. As he taxied out to the runway, the de Havilland party watched from the flat roof of the control tower, all of them taking care to look no more anxious or excited than if they were merely casual onlookers who just happened to be passing by. As Sir Geoffrey remarked in his autobiography *Sky Fever*, it was always like this on a maiden flight: no one would ever give anything away by displaying the slightest sign or expression of tension.

But as Geoffrey lined the little machine onto the runway for take-off, he glanced across at his father and his colleagues in the distance and knew what they were feeling. As chief test pilot he had made several maiden flights, including those of the Mosquito and Vampire, but he had never flown anything as radical as the 108. Although he was fully focused on the task in hand, the warnings from Farnborough as to what might be in store when he slowed up for the landing approach were not far from his mind.

A hop had been one thing, but by the end of this first flight everyone would know whether they had a viable experimental machine on their hands or something that might need some major redesign work. And so, as Geoffrey opened the throttle and once again accelerated down the long Woodbridge runway, everyone was silent, eyes fixed on the eastern end of the airfield. They watched the little jet gather speed against the long backdrop of dark fir trees, and then gave an inner sigh of relief and exchanged smiles as TG/283 lifted



Sales director Francis E.N. St Barbe (right) chats to Maj Frank B. Halford, chairman and technical director of the de Havilland Engine Company, as the party waits on the control tower roof for the return of TG/283. BAE SYSTEMS

off smoothly and continued in a shallow climb-out until she was lost to sight in the bright western sky, thus becoming only the fourth British jet-powered design to take to the air after the Gloster-Whittle E28/39, Meteor, and Vampire.

Half an hour later the distinctive shape of the 108 was seen on its landing approach. The group stopped chatting and focused on the descending aircraft, wondering anxiously how it was behaving at the supposedly more dangerous low speed.

Seconds before she takes to the air on her maiden flight, TG/283 gathers speed on the take-off run at Woodbridge. BAE SYSTEMS





Above: The unique shape of TG/283 on a low pass, the leading edge slats clearly visible.

Below: Shielding their eyes against the sun, the de Havilland party watch from the control tower as TG/283 climbs out to the west on her first flight. *BAE SYSTEMS*



They need not have worried: so smooth was the landing that it was almost an anti-climax. Geoffrey turned the machine round and taxied back towards the waiting party, who hurried down the control tower steps and gathered eagerly round the cockpit as he climbed out. He was smiling. It had been a very calm and relaxed first flight - and with none of the stability and control problems that had been expected. It wasn't perfect, for few maiden flights are, but Geoffrey reported that directional and lateral stability and control seemed normal and satisfactory. Aileron turns were fine, with no rudder being needed, although he found that bank angle had to be held off rather more than normal.

However there had been a touch of fore and aft pitching, which could be disturbed by bumpy air or using the elevons, and this was to become a major issue as the test programme progressed. He had not gone above 200mph, and was happy with everything up to that point, but he noted that at a minimum of 112mph there was slight elevon buffeting. As for the controls, they were not unduly heavy, but rather more so than those of the Vampire. Again, this had been expected.

In view of the untried factors surrounding this unique design, the first flight of TG/283 had been a remarkable success and everyone was cautiously optimistic. Wednesday 15 May 1946 marked the beginning of a four-year test programme that would involve three DH108 prototypes in a total of over 500 flights which would see triumphs, disasters, and the exploration of new boundaries.

Geoffrey de Havilland Jr brings TG/283 in at the end of the maiden flight.
BAE SYSTEMS



de HAVILLAND



Chapter 2

de HAVILLAND

The DH108 came in the latter years of Sir Geoffrey's life and was to be the first of the company's ambitious designs after the famous Vampire in this new age of the jet. It was followed by the DH106 Comet, the world's first operational jet airliner, and the DH110, which was developed into the Sea Vixen. These advanced and pioneering aircraft set new benchmarks in performance, but also heralded a disastrous period for the firm, as all were to be involved in spectacular and fatal crashes, and in the case of the 110 and Comet, with great loss of life.

Geoffrey de Havilland was a most remarkable, ingenious, and determined man. When he designed and built his first aircraft in the dawn of powered flight, he had never seen an aeroplane fly, so basically just made it up as he went along - and that applied equally to his piloting skills.



Days of fun and flying: young Geoffrey Raoul and his father wind up their rubber-powered models. BAE SYSTEMS

The story began when Geoffrey was born on 27 July 1882 at Hazlemere in Buckinghamshire, where his father was curate. Later the family moved to Nuneaton when the Rev'd Charles de Havilland was appointed vicar of the small Midlands industrial town. Although Geoffrey had the company of an elder brother, Ivon, and later another brother, Hereward, as well as sisters Ione and Gladys, he had a far from happy childhood. His father not only had a sharp and violent temper that could be roused at the slightest provocation, causing much anguish and tears for Geoffrey's mother, but his management - or, rather, non-management - of money was a great embarrassment to the family: he didn't pay back the loans he appeared



Geoffrey de Havilland at Farnborough in his second design, the one in which he made his first successful flight. Standing by the engine is Frank Hearle. BAE SYSTEMS

to think were his right and was never in a hurry to settle bills from tradesmen. Consequently, the name 'de Havilland' was not exactly welcome among local shops and businesses.

But it was with his maternal grandfather that Geoffrey found an escape, one that was to open up new horizons and loves for him and set him on the path that was to be his destiny. Jason Saunders was a successful businessman who ran a transport, removal, and warehousing company in Oxford, and also had a Thames-side farm at nearby Medley Manor, where Geoffrey spent his summer holidays. The peace, calm, and warmth of this idyllic spot were a blessed contrast to the tensions of home, and Geoffrey began to take a keen interest in engineering from watching the various crafts that were practised on the farm. It was here, too, that he developed his lifelong love of nature, particularly butterflies and moths, and this love is reflected in the names he was to give to some of de Havilland's most famous and best-loved designs.

Although it was assumed in the de Havilland household that Geoffrey would follow his father's calling into the Church when he left St Edward's School, Oxford, the 17-year-old had other ideas, for his overriding interest was in motorcars and all things mechanical. In 1900 he began training at the Crystal Palace Engineering School and then, after dabbling in motorcars with brother Ivon, took an apprenticeship at Willans and Robinson of Rugby,

where he built a successful motorcycle which his brother Hereward happily used for many years. In 1905 he became a draughtsman at the Wolseley Tool and Motorcar Company in Birmingham - but he soon became restless, especially when in 1908 he read about Wilbur Wright's air displays at Le Mans. This was the turning point: 'Here was something new that inspired me with excitement,' he recalled in *Sky Fever*. 'I was seized with an ambition to design and build my own aeroplane and engine and nothing was going to hold me back.'

And, thanks to the generosity of his grandfather who gave him £1,000 for that purpose, nothing did. In 1909, with the help of Frank Hearle, a young engineer from Cornwall whom he met while working at the Motor Omnibus Construction Company in Walthamstow, and who was to become a lifelong business partner, he set about designing and building his own aircraft - and, believing there wasn't a suitable engine available, designed that as well. It was an eventful year, for in May he married Louie Thomas, who had been governess to his sisters and younger brother, and within a few months Louie was sitting in a workshop in Bothwell Street, Fulham, stitching the covering for the wings of Geoffrey's first design. Keeping things in the family, Frank married Geoffrey's sister, Ione.

Eventually the aircraft was ready in November and he and Frank, together with Geoffrey's father and brother Hereward, took it to Seven Barrows, a few miles from the family home, which was now at Crux Easton in Hampshire. This land was owned by Lord Carnarvon, who later funded the Tutankhamun expedition. He was happy for his property to be used for the test flights, and earlier in the year Geoffrey had visited the rolling downland to assess its suitability. While walking carefully over it he heard skylarks singing and, being the nature lover that he was, made sure he found their nests and marked the spots so that they would remain undisturbed.

But on his first attempt at flight disaster struck. Various problems had led to frustrating delays. But, on a day when conditions were just right, Geoffrey climbed into the rudimentary basket seat that was bolted onto the skeletal framework, opened the throttle and gathered speed on the downhill slope. When he judged flying speed had been reached, he pulled back on the stick - but too hard: the machine reared up, the wing broke under the strain, and the stricken aircraft fell to earth in a tangle of splinters, wire, metal, and fabric. Geoffrey was unhurt amid the chaos until, anxious to let the onlookers know he was all right, he waved to them - and put his hand right in the path of the still-turning propeller. It was a painful day in more ways than one, and all that was left was for him and Frank to pile the wreckage onto a lorry and drive ruefully back to Fulham.

Undeterred, Geoffrey returned to Seven Barrows the following year. In a redesigned machine, using the original engine which was salvaged from the wreck, he made his first



Frank Hearle starts the engine as Geoffrey prepares for a flight at Farnborough in his first successful aircraft. BAE SYSTEMS

successful flight in the summer. It was only a few inches above the ground and a distance of about 20yds - but it was the start of a story that would become an aviation legend. That short flight meant more to him than any other. And there had already been another beginning that year: Louie gave birth to their first son, Geoffrey Raoul.

Geoffrey Snr spent many hours throughout that summer developing his piloting skills by trial and error. By October he was confident enough to take Frank Hearle up for a ride, so a second seat was bolted to the airframe behind the pilot's. After Frank's flight, it was Louie's turn. Whether she went out of duty or enthusiasm is not recorded, but she obviously had a lot of faith in her husband, for on that flight she held their new baby in her arms, which must have made little Geoffrey the youngest person to take to the air at that time.

These test flights were all very well, but neither he nor Frank were in work and finances were beginning to dwindle. However, a solution was at hand: on the advice of