

The Finest Years for an Aircraft Designer

Scenario

Yorkshire is a natural hub of the aircraft industry. Only 50 miles to the north of Swanland the first man carrying aircraft in the world was built and flown. Only 3 miles away is the world's oldest aircraft factory in continuous production and the last British factory to produce a complete aircraft.

Consider the scenario in the years after the war in the aircraft industry. A vast capacity had been built up by Lord Beaverbrook, the Minister for Aircraft Production. Before the war ended a committee under Lord Brabazon put together proposals to develop this capacity for civilian purposes. A number of aircraft programmes were initiated, some more successful than others, the most ambitious proposal was for the Comet but there were other types, some successful, some not quite so. The Viscount, Dove, Heron, Ambassador, and Britannia are examples.

In addition to the Civil aircraft there were still Military aircraft in the face of the Cold War threat from the East and the vibrant aircraft industry was as a very attractive career choice.

My Choice

I applied to the De Havilland Aircraft Company to be trained as an aircraft designer; this training scheme was the crème de la crème and carried out initially in house with accommodation, lecture theatres, workshops and drawing office. After a couple of years the academic subjects were transferred to a separate college serving not only De Havilland but also other companies in the area such as Handley Page and Napier. That college is now the University of Hertfordshire.

For a year I was taught how to make things and then moved to the factory to gain production, design and testing experience. The De Havilland Comet 1 was in service when I applied to the company but by the time I joined the aircraft were grounded by a technical fault. Most of my time in production was involved with the modification and development of the Comet which became a very successful aircraft but just a few years late to the market because of the modifications.

I was lucky to be involved in testing which involved a lot of flying and my last job in training was in the stress office calculating the strength of the structure of the Trident aircraft; this was the most boring episode of my

whole career and I was thankful to be offered permanent employment in the design office. I spent a short spell on the Blue Streak Intercontinental missile but most of my time was spent on Comet and Trident in the course of which I was sent to Rolls Royce to learn about the Spey engine which powered the Trident. I finished my time at Hatfield as the “engine man” which had a part to play in my next move.

Despite the strength of the industry it obviously needed to contract and the government persuaded or bullied companies to form alliances, those who did not comply, like Handley Page, were “eliminated”.

As the companies merged and contracted there was a mass exodus of technicians to America colloquially known as the “brain drain”. Some would return in later years but many were lost for good.

The government accelerated the decline of the industry by mass cancellations; TSR2 at Weybridge, Advanced Harrier at Kingston, HS681 transport and the plan was to buy American.

De Havilland was forming an alliance with Hawker, Blackburn, Avro, Gloster and other small companies to become Hawker-Siddeley and very quickly staff were moving around as programmes waxed and waned. Personally I needed a new challenge as Comet and Trident designs were complete and this led to a move to Blackburns at Brough which was producing the Buccaneer aircraft. The Mark 1 was underpowered and it was to be re-engined with the same Spey unit as the Trident and was I not the “engine man”?

I moved to the Brough design office in 1961 to work on the engine installation and the associated air systems. The Buccaneer with this new, more powerful engine was very successful and was used by the Royal Navy and Royal Air Force until 1994. It was specifically designed to operate at high speed and very low level where the buffet necessitated a very strong airframe, the core of which was machined out of 100 ton steel. On mutual exercises the Americans used to say that you couldn't see a Buccaneer coming until it had gone past.

Across the industry the government were still cancelling programmes and procuring from America. Buccaneer design work was finished and the staff at Brough were vulnerable as it was a single project site; the management of the time were very forward thinking in establishing relationships with other sites. Brough bid for and won the contract to support the American McDonnell Phantom for the RAF and Navy and

this contract was very valuable in keeping the teams together with design, testing and production work over many years.

In 1967 a new way of working was established. The few aircraft programmes left were shared between the companies that still remained. From this time on designers were deployed all over the world. I joined the Airbus programme which was put together between the British, French, German and Spanish governments. The Airbus has taken on the might of Boeing and won. At the last ditch negotiations the British government pulled out but with remarkable foresight Hawker Siddeley took a 20% stake in the business themselves. This has proved to be a wise investment but the actions of the British government will come home to roost if ever there is a contraction in the airline business.

The Airbus programme was run from Toulouse. The wing was sub contracted to British Aerospace at Hatfield. The flappy bits at the back of the wing were sub contracted to Brough. In the initial stages of the project I worked from Monday to Friday at Hatfield with many day trips to Toulouse. Prior to the Airbus generation the flaps on aircraft which give extra lift at low speeds were simple hinges. We designed the Airbus flaps to initially track back to increase the wing area and then rotate down to increase drag for landing. This was new technology and very challenging, we had to make sure that structural failures in service due to wear or fatigue did not jeopardise the safety of the aircraft and passengers. I flew to Cyprus in an early Airbus a few years ago and was pleased to see the flappy bits still working fine.

In 1972 I joined a team at the Hawker factory in Kingston with other designers from Brough and Hamble to conceive the aircraft which was the highlight of my career – the Hawk. After settling on the basic design of the aircraft we brought the wing and rear fuselage back to Brough for detail design and manufacture. At this time electronic calculators had not yet been invented, rough work was calculated with a slide rule and the precise wing geometry was derived using seven figure logarithm tables!

Later as the industry further contracted the Kingston factory was closed and the whole aircraft was manufactured and flown out of Brough. Over 1000 have been built.

In 1973 I was back at Hatfield to join the design team of the BAe146 small airliner, this time I was given a section of fuselage to design which included the toilets, a new venture for me. Due to world financial

downturns resulting from the oil crisis, British Aerospace decided not to proceed with the project and stopped work. To avoid redundancies the government Minister Antony Wedgwood Benn threw money at the project to keep it alive. Eventually it resumed but it was not a great commercial success although technically sound and still flying. By this time I had moved on.

The Kingston factory had designed and manufactured the Harrier vertical take-off fighter and as well as building for the RAF they also supplied the Spanish and Indian air forces and the US Marine Corps. The latter were interested in a developed version and the US government would not put up funding unless British Aerospace were involved to reduce the technical risk. We were after all the experts! I had never worked on the Harrier but I found myself in St Louis in 1977 on my own talking about extending the aircraft fuselage. This did not proceed but a new version - the Harrier 2 was conceived. I joined a team in St Louis with other designers from Kingston to put the idea together. The design and manufacture of the rear fuselage was brought back to Brough. The UK government also bought Harrier 2 from the U.S government.

When I started in the industry there were 33 companies all designing and producing complete aircraft, today there is not one. There are no UK projects, aircraft like Tornado and Typhoon are produced in collaboration with other European nations. Our other major aircraft projects are bought from the USA.

Manufacture of the Airbus has been an outstanding success, the UK provide the wings and most of the engines – a major part of the aircraft. As the government has no stake in this there is the risk that if the industry contracts this work will go into Europe, not immediately but over time.

The French, German and Spanish governments continued in manufacturing of aircraft and cars which will recover from world pandemics far faster than our service based economy.

I finished the last 15 years of my career as a boss at Warton in Lancashire with lots of adventures round the world but that is another story. My heart remains however with the design of aircraft.

Barry Kensett
Project Director British Aerospace (Retired)

Addendum – Aircraft with which I have been associated:

De Havilland Comet
De Havilland Trident
De Havilland Blue Streak
Blackburn Buccaneer
McDonnell Phantom
De Havilland Sea Vixen
Hawker Siddeley Hawk
BAE 146
Pilatus PC-9
Sepecat Jaguar
English Electric Lightning
English Electric Canberra
Panavia Tornado
BAC Jet Provost
Hawker Siddeley 125