CROWOOD AVIATION SERIES

Vickers VC10

Lance Cole

Contents

Author's Note

This is primarily the story of one aeroplane, but it is also the story of the end of an era. The VC10 had its roots in the last days of the British Empire and in the first days of the New-World order of the jet age. It was born out of several requirements and from various design ideas, which eventually came together, through fate and fortune, to create a great aeroplane. That aeroplane turned out, through no fault of its own, to mark the end of Britain's dominance of the world airliner market.

No other industrial project has ever been so affected by politics, power games and hidden agendas. No other airliner has been exposed to the effects of opinions, ignorance and egos in the way that the VC10 was. The story of the VC10 is both the story of an airliner design and of an airline world set in an age with changing horizons. It reads like the plot of an Arthur Hailey thriller. Intrigue, politics, design secrets, geo-political events, the end of an empire, and much more, are the core of the VC10's life.

Even today, the VC10 and its history are misunderstood. Many claim that the VC10 should have been developed to make better use of the lengthened runways that came into being. In fact, Vickers had planned to do just that. Its expansion of the VC10 into a larger, more viable airframe was curtailed by the customer, yet it is the manufacturer that is too often blamed for failing to develop a rival to the 707 and DC-8 variants.

This book is an attempt to combine all the elements of the VC10 story in a definitive history of the genius of Vickers design, set amid the politics and corporate history of the day. Hours of detailed research have been undertaken, with those who were there when it all happened, those who drew the drawings and calculated the figures, and those who were part of the plot in the other ways. New details and new drawings have been unearthed to contribute further to the unique story of the VC10.

Lance Cole, Wiltshire, England, 1999

Foreword

Like too many British products the VC10 became immersed in politics and differing attitudes of various chairmen of BOAC. I was intimately involved in the VC10 as Chief Test Pilot of Vickers-Armstrongs when I succeeded Jock Bryce, who became the Chief Test Pilot of the British Aircraft Corporation on its foundation in 1960.

By this time the VC10 was well underway and it was made clear to me that Jock Bryce would still make the first flight with myself as co-pilot. The VC10 order from BOAC was announced in 1958. I recall the very detailed discussions with BOAC and one saw a lot of Captains Cane and Field, under Captain Roy Alderson. All the deficiencies noted on their other jet transports, Comet and Boeing 707, were supposedly eradicated on the VC10, which was aimed at the Empire routes. By the time the VC10 appeared, there was no Empire and the airports to be used had grown long runways. However, the basic requirement of exceptional airfield performance demanded a rear-engined configuration. All the systems were duplicated without much regard to aircraft weight, but as is explained so clearly in his book, BOAC got what they asked for.

Jock Bryce and myself worked very closely on preparations for the first flight, spending many hours on the flying control rig and on learning all the other systems. There was no development simulator in those days. We had to do most things for ourselves including preparing the checklists. One item – air conditioning – had a question mark against it in Jock's mind, so he wrote 'see E.B.T.' (my initials). Unfortunately our handiwork went off to the printers before this was rectified. So there were many laughs on item 5: air conditioning – see EBT. What happened if EBT was not present? A slip of paper cured the problem just before the first flight.

There was a general sigh of relief when, after much careful thought, Jock and I recommended to Sir George Edwards and Ernie Marshall that we were happy to make the first flight from Brooklands on its 3,800ft runway, instead of at Wisley which in our view did not offer sufficient advantage to justify the horrendous task of taking this great monster – Europe's largest aircraft up to that time – by road to Wisley. Brooklands' runway was lengthened by 400ft but because of Lord Brabazon's monument, the extension was laid at a slight angle to the main strip. All VC10s/Super VC10s flew out of Brooklands in this manner, and it seemed rather comical coming round the corner at some 100 knots!

The first flight of G-ARTA was made on 29 June 1962 and so started a tremendously interesting and demanding flight development programme, which was not without some major incidents and problems, especially in cruise performance.

No story of the VC10, about which there have been several, has had the unique depth of detail of this book by Lance Cole. The basic theme is a tribute to the work of Sir George Edwards and the late Ernest Marshall. Lance has done this admirably and I here commend his work most highly. I am sure that its readers will get as much enjoyment and interest from it as I have done.

The VC10 was a beautiful aircraft to fly and it provided a level of comfort that had not been experienced before. It is a tragedy that its development did not continue, as it had so much to offer. Too many of our best inventions have followed this short-sighted route.

Brian Trubshaw MVO, CBE, FRAes

Introduction

If today, at the end of the twentieth century, a team of engineers and aerodynamicists were asked to shape an airliner for difficult operating environments, certain essential ingredients would be necessary. The airliner could have a swept wing, sculptured shape with an ultra-efficient, uninterrupted, high-lift device-equipped wing. The fuselage could be flush fitting, the wing-box could be smoothed in, and the tail could have plenty of ventral fin area. For maximum aerodynamic effect, tuned to all airfield operating demands and asymmetric handling requirements, the aircraft would almost certainly be a T-tailed, clean-winged design with rear- or high-mounted engines.

In response to such requirements, today's designers might well produce a shape identical to that of the Vickers VC10. Indeed, when the task of designing just such an aeroplane was set as a theory question to a group of British aviation experts, they did draw what looked like a VC10. The giant McDonnell Douglas/ Boeing C-17 Globemaster military transport also utilizes the high-lift, strong-body, T-tailed concept to perform exactly these tasks. It does have its engines on the wings, but those wings are high-mounted – a structure that is not widely acceptable in the civil market. The capable Airbus A340 uses a 707-style layout with podded, underwing engines, but surely that is because it is a derivative design descended from its A300 family of forefathers. Given a clean sheet, Airbus Industrie might well have aped the Caravelle and designed a rear-engined product with a clean wing.

Developments in engine thrust and runway length have changed the perspective of design possibilities, making the job of hot and high payload uplifting less of a problem. Yet the fact remains that, in the context of its time, when hot and high payload uplift and range *were* design-related problems, the VC10 design *was* the answer.

The VC10 was surely a masterpiece of thinking in an age of commercially orientated, conventionally designed airliners and the experts and commentators of the time confirm it.

The efficiency of the VC10's design was reflected in its handling qualities and superior runway performance. It is true that its early-generation engines handicapped its fuel efficiency, but that was within the context of the time and not the fault of the aircraft; indeed, until they were re-engined, its competitors also suffered the same handicap, although they made a worse job of adapting to that handicap. For example, the VC10 could uplift and have range, while the 707 of the time would require an expensive *en route* refuelling stop that undermined its economics.

British Airways Super VC10 shows off the clean lines and elegant stance of the model.


Super VC10

VC 10

LAREE COLE

CROWOOD

PRESS

RAMSBURY

MARLBOROUGH

WILTSHIRE

SN8 2HR

1st FLIGHT OF V.C.10

JUNE 1962

We were carrying out cases from Weybridge station & saw it lifting off. What a sight & how proud I felt listening to the roar of those R.R-Conway engines

The Vickers VC10 was a superb aeroplane that could have been a world beater but for the politics that surrounded it. Lance Cole tells the full story of its design and development in this welcome addition to the Crowood Aviation Series. Using original Vickers documentation and interviews with the design and flight team, he has amassed a wealth of material, from its roots in the stillborn V1000 through to its current use with the RAF. *Vickers VC10* is a fine tribute to an expertly engineered aeroplane.

ISBN 1-86126-231-0

9 781861 262318 >