The Concorde Story

March 6th 2012
Norman Long

At our March meeting Norman Long gave a remarkable visual and systematic account of the challenges and magnificent achievements in pioneering aerospace developments which led to the memorable era of the Anglo-French Concorde.

A favourable basis for potential development of a supersonic passenger aircraft was established through studies in 1954 by the Royal Aircraft Establishment, Farnborough, with realistic projections from the existing technologies required. UK studies 1957-59 involved the leading skills in major UK companies and led to the delta winged design with four under wing engines capable of carrying around 100 people at Mach 2.2, i.e. 1300 mile per hour. The November 1962 Anglo-French agreements for joint design and manufacture led to facing problems not only the equitable sharing of technology, costs, manufacturing sites etc. but also the integration, transport and assembly of the designated major components. The considerations for the wing shape, the effects of high altitude and the massive effects of operating temperature changes on the expansion/contraction of the fuselage c. 20cm, together with materials and the raw engine power were daunting but overcome.

The Bristol Olympus turbojet engines used on the Avro Vulcan “A” bomber were the basis for novel design improvements necessary to control air inputs at supersonic speeds. Other major innovations included control systems with remote “fly by wire”, landing tricycle undercarriage, pumped fuel transfer for balance and structural cooling and the famous “droop snoot” for pilot visibility on landing and take-off.

Competition challenges arose from the US and Russian SST ventures with the latter achieving Mach 2 with the Tupolev Tu-144 in 1968. However, the US programme was cancelled on cost grounds and the Russian one also following limited cargo service after the Paris Air Show crash in 1973. The French prototype Concorde made its maiden flight from Toulouse in March 1969 whilst the British prototype Concorde flew from Filton the next month. Concorde could fly at twice the speed of sound at 1350 mph and up to 60,000 feet high, about twice the height of Mount Everest, and from London to New York in 3.5 hours. The first BA supersonic passengers flew on this transatlantic crossing in January 1976.

Problems of the “sonic boom” and opposition, especially against New York landings, with cost factors, reduced sales of 74 aircraft to those supported in the UK and France. Also the introduction of the Boeing 747 carrying four times as many passengers at much reduced costs proved damaging. Concorde flights to Bahrain 1976 and Washington 1976-79 were later followed by flights into New York in October 1977 after the beauty of this aircraft was seen and realistic attitudes to noise levels were adopted. A range of other flights followed until the Air France crash outside Paris in July 2000. Following extensive upgrades and further costs BA operated services and short tour flights until October 2003 when the last operational flight from New York to London took place.

As Norman pointed out, the Concorde achievements are legendary and unlikely to ever be repeated. His talk was warmly applauded and had found great resonance with those present.