



Issue 28 - Mar15-Apr15

# Contrails

## Newsletter of the Christchurch Aviation Society

CAvSoc

### Transatlantic Betrayal

Our first talk for 2015 was from Andrew Porter who has written a book of the same name. It covers the development of the jet engine in airliner use and in particular the era of the high by pass ratio (HBPR) engine and how Rolls-Royce's lead was usurped by USA companies and politics. RR not only developed the RB211 high bypass engine ahead of the USA but included the pod or nacelle that integrated the engine to the airframe. This was more sophisticated than appears from the outside and was built by Short Brothers in Belfast. The RB211 was targeted at the new range of wide body large transport aircraft, the Lockheed TriStar and McDonnell Douglas DC10, Boeing 747 and the Airbus A300 in Europe.

On its journey to the RB211, Andrew explained that Whittle had patented the by-pass concept in 1936 but the patent ran out in 1961 – just when bypass engines were being developed. RR had developed the Conway engine, with BPR of 0.36:1 the World's first by-pass engine to enter service, powering the Boeing 707-420 in passenger service in 1960 which gave better range and performance than other engine solutions followed by the DC8 and later the Victor and VC10 with a higher BPR of 0.6:1. Pratt&Whitney followed a year later with a turbofan solution so preventing RR capturing the market. The USA wanted a large freighter (which became the C5A) and so high bypass ratio engines now had full government support and GE succeeded with their TF39. RR response was to review their RB178, started in the early 60s, a three spool engine with a BPR of 2.5 with later versions having a BPR of 6 and 44000lbs. Again this engine aimed at the 747 was used to spur on P&W to play catch up rather than give RR a slice of the market and P&W won the 747 order with its JT9D. A number of events followed, the RB178 was cancelled by the treasury, and a new engine the RB203 was under development known as the Advanced Technology Engine utilising three shaft construction – 3 concentric shafts connecting low, intermediate and high pressure parts of the engine. Whilst more complex, this layout promised better fuel consumption with quieter performance. The follow on engine the RB207 was a large engine suited for a twin engine airbus type but the US market decided on a 3 engine layout. Anthony Benn was after this market and subsequently the RB211 was a

smaller engine but both Douglas (DC10) and Lockheed (L1011) were interested. In his eagerness to get a contract after Douglas pulled out, Benn committed RR to a disastrous contract with Lockheed which allowed them to change specifications at RR expense. This combined with technical difficulties sealed the fate of RR as it was. Nationalisation was the only option to keep the company from going under and to enable its survival.



### Vulcanology

Following discussions on ways that the legacy of the Vulcan could be delivered and utilised to inspire the next generation of engineers and aviators, The Vulcan to the Sky Trust (VTST) and Aviation Skills Partnership (ASP) launched plans to create the Vulcan Aviation Academy and Heritage Centre at the home of the last flying Avro Vulcan – Robin Hood Airport Doncaster Sheffield.

### Meetings for 2015 - at Druit Hall commencing 8pm

**Wed 4th Mar** - "Paragliding, the Ups and Downs" by Neil McCain.

**Wed 6th May** (AGM) - "Earliest Pioneers of Aviation (prior to World War 1)" by Peter Roe