



Issue 27 - Jan15-Feb15

Contrails

Newsletter of the Christchurch Aviation Society

CAvSoc

History of Flight Refuelling

For our November meeting, last for 2014, James Kemmitt from Cobham Missions Equipment gave a talk on the past present and future of Air to Air Refuelling. Even in 1909, shown by a cartoon from Punch journal, the need for in-flight refuelling was recognised. It wasn't until 1921 that a patent for a process was filed by Alexander Seversky, a Russian who, to avoid the turbulence following the Russian Revolution, stayed in the USA after his posting in the Russian Embassy. In 1923, two DH4Bs transferred fuel via a pipeline enabling one to remain aloft for 37 hours, albeit with 15 'contacts' for fuel but also engine oil. By 1929 the US Army Air Service achieved 150 hours with 34 contacts. Alan Cobham had been pioneering long distance flying routes, for which he was knighted, and also trialling AAR. As a director of Airspeed a Courier was modified as a receiving aircraft for a non-stop flight to Karachi using a Handley Page W10 as a tanker. The attempt ended in tragedy with the Courier having to make an emergency landing in Malta and the tanker crashing on its return flight – but the process had been a success. Flight Refuelling Limited was created by Sir Alan in 1934 and a contract awarded after evaluation of methods leading to a successful 'looped hose' system in 1939. In 1949 a Super-fortress flew non-stop around the world using Cobham's system, but with a modification to allow high altitude transfer. The probe and drogue was developed in 1948 and the USA was again very interested and adopted the system as well as developing their boom method. There have been competitors but the technology is more sophisticated than is apparent with the key being the ability to maintain the correct tension on the

hose despite the connection load and movement of the receiving aircraft. Development has enabled helicopters to use the system although this can be hazardous as shown in a film clip resulting in the probe being cut off by the rotor blades. Most pods have used a hydraulic system for controlling the hose but now electric powered hose drums are in use. Design of the drogue is also critical and the high speed variable drag drogue enable a low speed range – suitable for rotor wing such as the Osprey – and high speed for the usual fast jets. Future developments include more electronic control for the hose drum units and development on the drogues to cater for a wide range of speeds. Much of the technology development occurs around the probe itself to ensure good integration with the airframe and control systems for the aircrews. Even back in 2007 tests were under way with manned aircraft for the development of autonomous AAR. The trend towards UAVs will provide further development challenges but formation flying, a precursor, is already established and the probe and drogue system may well be the system of choice.



GR4 'receiving' from VC10 over Iraq - USAAF pics



KC135 with boom system as well as probe and drogue



Courtesy Phil Lynes

This Sea Vixen, XJ474, is the first Navalised folding wing version of the DH110 seen with people from the experimental department. This aircraft, flown by Jock Elliot, was used for testing the auto pilot and had an electric starter.

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