

The Royal Aircraft Establishment During WWII with Graham Rood

It was with great pleasure that we welcomed back our good friend Graham Rood, from the FAST Association to tell us about the crucial role that RAE played during WWII.

He began by telling us that there had been 5000 personnel during WWI, 3000 of whom were women, but that number had reduced to 1000 by 1937, mainly due to lack of funding. The RAF, too, had suffered a lack of investment, so as war loomed there was a great deal to do to catch up, and every department played its part in improving aircraft performance and aircrew safety, with staffing levels rapidly increasing.

Some major developments had taken place previously, with the construction of the seaplane tank, opened in 1932, and the 24' wind tunnel opened in 1935. Later additions included the structural test facility, opened in 1938 and the high speed tunnel, opened in 1942.

The 24' wind tunnel could test full-size engines and was used extensively on experiments to reduce drag. In 1938, a Heinkel 38 was purchased from Germany and used to discover the secret of their technology. Other areas of testing were gun turrets, radiators, bomb trials, glider torpedoes, aircraft carrier lift devices and kites, for lifting cables and aerials.

The R133 high-speed/transonic tunnel operated from 1942 till 1954, and is a closed tunnel that can be pressurised, like a thermos flask. Working with speeds up to 600mph, it was cooled by brine tanks, and was used to test jets.

The Q120 seaplane tank was 650' long, 9' wide and 4.5' deep, with a wave generator, since seaplanes need slightly choppy water for take-off. In 1941 it was used to test a Spitfire floatplane, destined for Egypt.

When war was declared, it made little difference initially, though one significant change was the construction of concrete runways in 1942, to accommodate heavier aircraft; large areas of grass were still essential, however, for crash landings.

Photography had been used during WWI, and the Wireless and Photographic Department set up in 1924. They had developed the F8 film camera, designed by Harry Stringer, but it was the maverick civilian Sidney Cobb who was to revolutionise the technology, conducting numerous experiments before coming to Farnborough to work on Spitfires. The first photo reconnaissance of WWII took place in 1939, which pilot Shorty Longbottom flew at 34,000'.

The camera was capable of taking stereo shots, and in 1942 was adapted to create the F52 long lens camera. It could take both vertical and oblique shots, and could be mounted or hand-held. Analysis of this photography was vital tactically, for example, to estimate the speed of ships, and strategically. Later innovations included painting Spitfires duck-egg blue to make detection more difficult, and the development of the Bazett pressurised jacket to facilitate photography from 36,000'.

The High Altitude Research Department developed survival kit in the RAE pressure chamber, using air crew selected for their suitability, and establishes a number of world altitude records with pressure suits and pressurised cockpits.

The Physiological Department conducted important oxygen research, leading to the development of a prototype full pressure suit—basically a spacesuit.

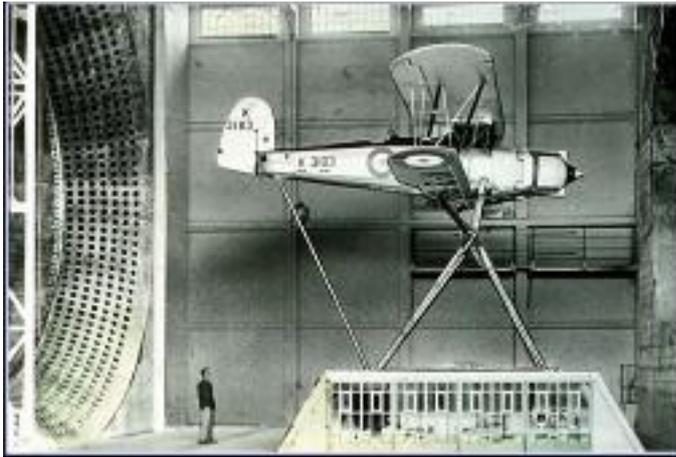
Improvement to gunsights was another success, with the development of a gyro to allow for offset, which increased firing accuracy from 3% to 6.2%. Also, bombsights were improved, incorporating a mechanical calculator, or early computer.

Some of the less glamorous departments also made significant contributions: oil heating systems to improve engine starting in the cold; improving construction design to make aircraft more robust; developing wireless and radar technology; improving lifeboat systems and camouflage. The Electrical and Ignition Department, particularly, solved a wide range of problems related to things like humidity, ignition, fuel efficiency and incendiary bombs.

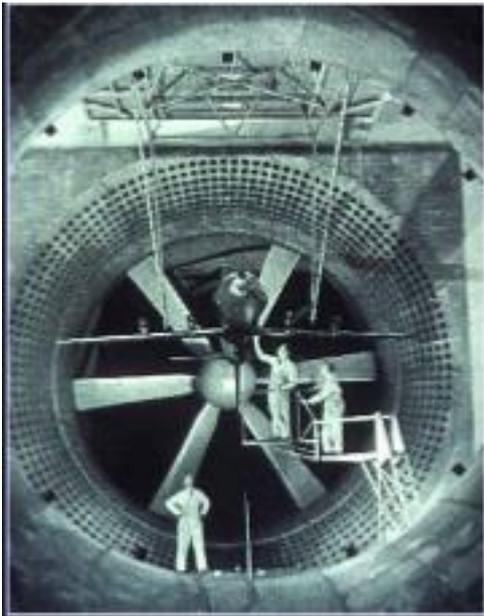
The Wireless Department developed VHS wireless, which was trialled in 1940 and in full operation in time for the Battle of Britain. The famous 617 'Dambusters' Squadron carried RAE equipment during Operation Chastise, the high-risk raids on the dams in the Ruhr Valley, with Wing Commander Guy Gibson judging that it provided the 'perfect level of control'.

Enemy aircraft evaluation was another area of research, with technicians rebuilding crashed aircraft for comparison, to gain valuable insight into their construction and performance, in an effort to gain an advantage over the enemy. Small wonder that Germany took a great interest in what was going on at Farnborough.

Graham's lively and informative talk really brought to life the huge contribution that Farnborough made to the war effort, constantly refining every aspect of aviation. It was a time of great innovation and many of the advances made at that time are still having impact today. Since so many local men and women were part of that, we should all take great pride in our WWII aviation heritage.



24' wind tunnel showing scale



Captured Luftwaffe aircraft and RAF aircraft at the Royal Aircraft Establishment 1945



Testing equipment in the pressure chamber 1945



The remains of the sea plane tank



