No.17 Q3 2015

Rochester Avionic Archives Newsletter

From the Curator

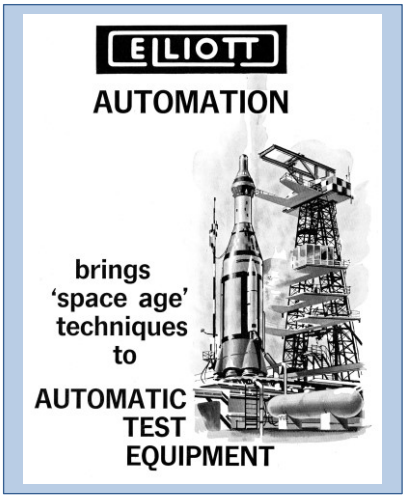
We had a most enjoyable weekend supporting the Company at Chatham Dockyard for the 'Salute to the 40's'. I managed to meet Montgomery, Churchill and various other look alike celebrities! The stand was right beside HMS Cavalier which we certainly did not appreciate when the guns were fired!

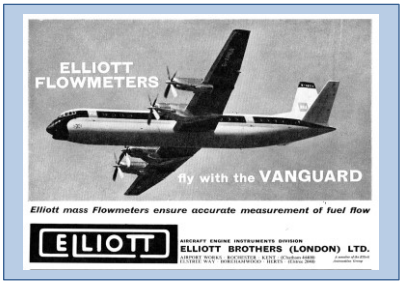
We have found some more space in the 40' Hanger in a room where the old plan chests of site drawings are stored. Many of these plans are themselves historic documents, although many are still in use by the site services team so we plan to archive these but overall we can store some of our ever expanding collection in a more accessible way. Recently we gained a lot of aircraft models and some awards so the collection is growing all the time but space to store it is not.

Chris Bartlett
Curator

Salute to the 40's at Chatham Dockyard

Some more Company advertisements from various dates





Curator: Chris Bartlett, Deputy Curator: Ann Jackson, Secretary Geoff Harvey
Tel: 01634 203321
e-mail: curator@rochesteravionicarchives.co.uk ***Website:*** www.rochesteravionicarchives.co.uk

Around the Divisions (4) : Gyro Division

Although the Company had manufactured simple rate gyroscopes since 1950 and had incorporated other makers' units in several equipments, original work on gyroscopes of the highest quality did not begin until 1957 with the establishment of a small section at Borehamwood, for which key personnel had been trained at Massachusetts Institute of Technology under Professor C.S. Draper. In 1960 this section began supplying sub-miniature fluid-filled rate gyros under a sales agreement with Northrop Nortronics Corporation, and the volume of work was sufficient to justify formation of Gyro Division in 1961. This was transferred to Rochester in 1963 and the manufacture of these instruments commenced in new 'super-clean' rooms, since when some thousands have been supplied.

The Division applied its knowledge of airborne gyro equipment extensively to guided missile applications, for example in 'Sea Dart', 'Sea Cat' and 'Martel' air missiles, and to naval torpedo applications in which the problems are of a similar nature. Aircraft for which equipment has been supplied include TSR 2', 'Sea Vixen', 'Phantom', 'Harrier' and 'Concorde'.

START Gyro

In 1980 first production deliveries of the Control Sensor Unit for the Sting Ray Torpedo were made and further developments took place to provide a system for Spearfish.

In 1984 a new solid state gyro called START commenced development testing. This was designed for smart missile application being capable of sustaining up to 400g.

Production of the START gyro commenced in 1986 and the design for a suspension stabiliser for Formula 1 racing cars was begun. Both test firings in missiles and tests in racing cars took place in 1988. In 1992 GSD won the Prince of Wales Award for Innovation with the START gyro.

In 1973 Gyro Division had merged with Inertial Navigation Division (IND) to become Guidance Systems Division (GSD) in 1984 and this was briefly merged with Airborne Displays Division (ADD) to form Guidance and Displays Division (GDD) in 1992.

Corrections to **'Around the Divisions ADD'**

Thanks for Peter Royall getting in touch and for sending in the following notes:

I joined Rank Cintel in the spring of 1963 working on the design of 625 TV equipment and special film development tanks. At the time of Elliott's involvement in take over of Ranks I was working on a special design of a miniature computer in conjunction with engineers Derek Wood and Brian Patrickson (subsequently both long term members of ADD.)
When the take over became fact, we had a choice, transfer to Ranks head office, joining Elliott's or staying with Ranks until Elliotts moved in, if we decide to stay during this period we would receive a months wages as a bonus. Too good to miss!
I decided to leave and joined Muirheads at Beckenham.

Geoff Wilkins was an engineer at Ranks, but the only occasion that we met was a lunch time drinking session when it emerged that we were both getting married on the same day. (Geoff too had a long employment with ADD).
Henry Steadman was chief draughtsman at the Ranks office and remained when they were transferred to Rochester.
In 1966 we were starting a family and moved to Aylesford, travelling to Beckenham was not easy so I applied for a job at Rochester, hence to my surprise I rejoined what was then DADD, located in the flying school area, remote from the towers.
A very strange atmosphere, two chief draughtsman, Ken McDonald on one side with Henry Steadman on the other not talking to each other. I nearly decided to move on but fortunately I was moved to the hangers working on ILAAS for LTV, under section leader Sam Dunlop. following the success of ILAAS we won the A7Corsair Project and eventually the drawing office was reunited in the towers, ADD was all reunited.'

A holographic picture of the F-16A/B PDU produced by Pilkington.

Unmanned Aircraft

Elliotts have a long history of working on unmanned aircraft (Drones, RPV or UAVs) to provide the Flight Control systems, surveillance equipment and data links. Over 800 remote control autopilots have been provided just for the Canberra U., Meteor U. and Jindivik.

Jindivik

In the 1940's the Aviation Division of Elliott Bros (London) Ltd was contracted to make a production version of the flight control system for the JINDIVIK target aircraft designed by the Australian Ministry of Defence in association with the Royal Aircraft Establishment. This was developed substantially to Jindivick Mk2 over the next few years and upgraded again through the 1960's and 1970's to Mk 102-B, Mkl03-A and Mk4.Jindivik.
The GEC Avionics control system in the Jindivik provided full ground control of the aircraft from engine start on the runway until it lands. The aircraft is stabilised in both pitch and roll.

Jindivik

Manned Aircraft conversions Canberra U.Mk10, Meteor U. Mks 15/16,

Meteor U15
http://www.airliners.net/photo/UK---Air/Gloster-Meteor U15/1600253/L/

GEC Avionics designed and manufactured the autopilot systems for the Canberra and Meteor strike aircraft when they were converted to the remotely piloted target role.
A Universal Drone Pack enabled manned aircraft to be converted to RPV use (and, if need be, back to their manned role), a special autocontrol package was developed. This package, (sometimes referred to as an "iron-pilot") was interchanged with the ejection seat and fitted onto the seat rails. The host aircraft then needed the minimum modification to wiring and hydraulics. The Sea Vixen employed this system, and this work was carried out in close cooperation with Flight Refuelling Ltd., who were responsible for the aircraft conversion.

Rushton Sea-Skimming target

Another project in which GEC Avionics worked closely with Flight Refuelling Limited was the Rushton towed target system. GEC Avionics produced the flight control computer which, together with a Plessey radio altimeter, was used to guide the target in accurate sea skimming flight (3 feet at between 17 feet and 500 feet) at up to 400 knots.

Falconet

Falconet

Falconet is the British Army name for the Advanced Subsonic Aerial Target known as ASAT. Falconet is a fast jet powered target used as the primary trainer for the British Army's Rapier SAMs and was designed and built by Flight Refuelling. The low cost philosophy dictated the provision of the simplest "on board" system consistent with ease of control in manual modes and adequate target stability in all proposed roles. It was possible to achieve this aim by supplementing the airborne hardware with a flexible ground based command control unit with a microcomputer interface between the operator and the target.

Machan

The Machan Programme

This programme, which was carried out on behalf of FCD by the Flight Automation Research Laboratory (another division of GEC Avionics at Rochester) embraced the provision of an unmanned aircraft flight research facility. This programme provided an experimental payload carrier which was used in a flight trials programme both by GEC Avionics and the UK MoD who, with the company, funded the programme.
Total responsibility for the aircraft, its avionics and payloads, the ground control station and conduct

Phoenix Battlefield Surveillance RPV System

The Flight Controls Division of (then) GEC Avionics Limited was selected by the Ministry of Defence (Procurement Executive) as prime contractor for the British Army's Phoenix remotely-piloted surveillance system This RPV was the Army's first fully-equipped pilotless aircraft system for realtime remote targetting and battlefield surveillance. It was a small air vehicle with advanced avionics and infra-red imaging system, an air/ground data link, a mobile ground station and logistics vehicles for launch and recovery. The first flight was in 1986, with an expectation that it would enter service in 1989, but the project suffered from numerous delays eventually entering service in 1999. The final operational sortie was conducted in May 2006

Phoenix

Obituary for Ray Dennis

"Ray Dennis who sadly died recently at the age of 68 first joined Elliott Brothers in the late 1960s. After obtaining an electrical engineering degree, he worked at FARL with Dick Collinson. He later worked in FCD, where as Technical Manager he was involved in all the Divisions projects. As Divisional Manager especially in the Boeing 777 Fly By Wire programme and also Phoenix. He made an immense contribution to all the work of the division, was always the most enthusiastic of leaders in the engineering departments. His energy and commitment enabled many important projects to be successful and he was always involved in all aspects of the Divisions work both business and social. In later years Ray was seconded to Warton and worked tirelessly on the very complex Nimrod programme. In 2005 Ray decided to take early retirement due to his increasing ill health and he and Jacqui his wife continued living in Throwley, where Ray was very involved with his family and in village life.

The 25 year service lunch for Bob Lawrence in 1972. Left to right are Ron Howard, Eric North (Production Manager Sheet metal panels), ? Glicksman of Fisher-Farris, unknown, John King (ADD) and the remaining three are unknown. *(Ed I don't even know which one is Bob Lawrence (ex Swift and Swallow))*

This was Maritime Aircraft Systems Division in 1978 wearing funny hats. (*No, I don't know why! I think the location is the iron staircase at the end of the old buildings opposite the new Falcon Building, Ed*)

Rochester airport

The Airport was leased to Short Brothers on the 1st January 1934, The land, as is the case with much of Kentish farm land, was liberally endowed with flints. So, to ensure a good surface the inmates of the local Borstal were used to remove tons of flints by hand!

The Cog Box!

This is an Air Data Computer from 1967 designed for the C-5A The C-5 Galaxy is a large military transport aircraft built by Lockheed. It provides the United States Air Force (USAF) with a heavy intercontinental-range strategic airlift capability and has been operated by the USAF since 1969.

An Air Data Computer computes altitude, vertical speed, air speed, and mach number from sensor inputs such as pitot and static pressure and temperature. The early systems were electromechanical computers, and Elliotts backround was as much in electronics as in precision gear making. After WWII Elliotts was acquired by Leon Bagrit who already managed Swift and Swallow on the Rochester site. During the Second World War the manufacturing company, styled B & P Swift Limited turned to war work, and manufactured aircraft equipment for the Ministry of Aircraft Production. This included flap and undercarriage actuators, which called for good gear and screw-cutting facilities and they also had a commercial arm making weighing scales which required gear wheels. Elliotts gained a precision gear capability and this can be seen in the early instruments such as this Air Data Computer. Hence the name of The Cog Box!

The Pika was built by GAF in Australia as a manned version of the Jindivik pilotless aircraft. The Pika first flew in October 1950 from the Woomera airfield. Known initially as Project 'C', two Pikas were built, and logged over one hundred flying hours in testing and ended its flying career in June 1954.

Commissioning the Blue Steel Inertial Navigation System at Rochester in 1962. Brian Teather is in the background of this picture. Coincidentally the obituary of Sir Michael Beetham (one time Chairman of GEC Avionics) records that 100 V-Bombers were at 15minute readiness during the Cuban Missile crisis of 1962