No.11 Q3 2013

Rochester Avionic Archives Newsletter

From the Curator

Just as we think everything has gone quiet we have the prospect of a complete revamp of our website. The software used behind our present site is quite old and that alone means we should do something. The new look website will be viewable on mobile devices and will allow us to make many changes ourselves.

The link with BAE Systems Heritage Product Committee is proving exciting. We are looking forward to the last flight of the VC-10 in September and there will be a number of ceremonies. There are already preserved VC-10's but with the rest being broken up we have an opportunity to acquire missing items from our collection.Then next year we have the 50th anniversary of the maiden flight of the TSR2 in September 1964. So, we may well be asked to supply exhibits. In the reverse direction we may well gain display panels and even be able to have aircraft for flypasts or static display at any future Open Day.

We are very proud of our latest display in the Restaurant area which is themed on Memorabilia; all those fluffy give-aways from Open Day, a few awards and the old Marconi Flag flown from the towers are just examples. The Haskett Trophy was found in a shopping trolley on the site!

We have just renewed our Notice Board on the Mezzanine corridor of the towers and we have some ideas to increase the displays in the Main Reception area; so we are keeping busy!

Chris Bartlett

New Street Names

Recently the Rochester site sprouted street names on the corridors in the main factory. Such names as Wellington Way and Apache Way are to be seen. No doubt these will help people find their way around. Not to be outdone the RAA team produced our own name for the corridor outside our office and naturally called it 'Memory Lane'. You can just see the picture of the Team wearing our 'Janet the Gannett' caps.

We now also sport Berghaus Fleeces with our new logo on them *(Just in time for the hot sunny weather Ed)*

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Located at BAE Systems, Airport Works, Marconi Way, Rochester, ME1 2XX

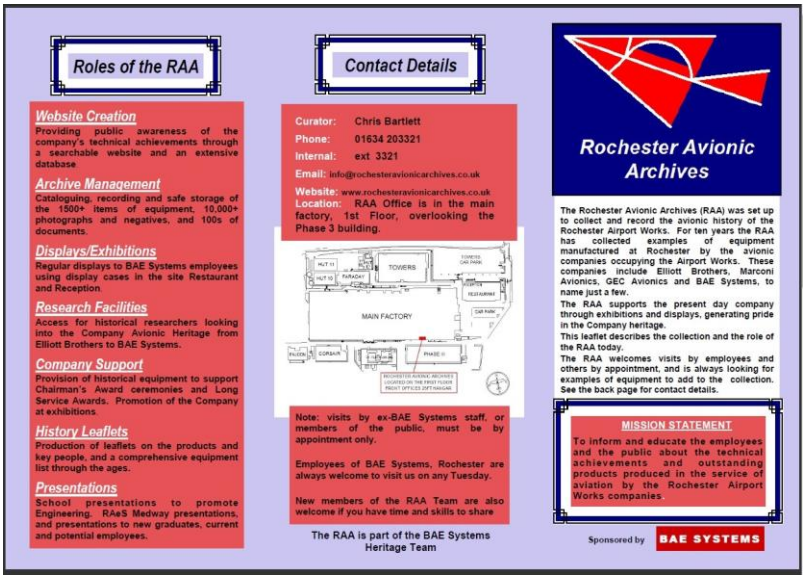
The rather poor picture is of the IN Div design team but sadly we do not have any names.

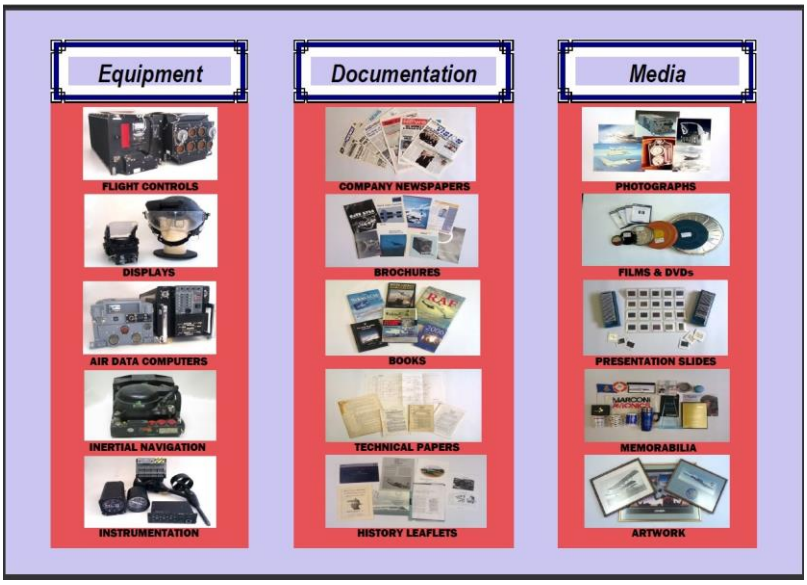
The Naval Compass Stabiliser system (NCS1) comprises three sections: The Space Reference Unit (SRU); the Electronic Pack (EP); & the mount on which the SRU sits on, called the Resilient Mount Assy (RMA). The RMA having three variant's!
There are a number of these on the Rochester site and as they are VERY heavy we are just trying to retain the Gyro Compass Unit; the big grey drum. *(How we get it into the Museum I do not know? Ed)*
NCS1 is rather historic especially in view of the major part it played in the Falklands War. NCS2 is supposed to be a follow up (using a laser gyro system) but it has not been seen yet.)

The single storey building was built by Short Bros and was certainly there when HM George VI and Queen Elizabeth visited in March 1939. The building was made into its present two storeys in about 1961. Interestingly the upper storey is cantilevered out over the lower onto pillars as the original structure could not support the weight of a second storey. The entrance seen in the Royal visit picture was named the 'William Elliott Entrance' . The top picture is taken looking towards the Main Hanger.
The Rochester Avionic Archives office and store are located in the finished section of this extension.

This is a picture of the Elliott Apprentices afloat on the Medway in the mid 60's. We think they are D.Burgess, S. Macfarlane, D. Christy, C. Murray, L Martin, D. McSweeney and D Butler (the Cox). (*Only some of them have Life Vests; are they the non-swimmers or the sensible ones!Ed*)

Our new Leaflet





Geoff Harvey has produced a Leaflet for us which is trifold and double sided. The idea is that we produce these in volume and have them in the Restaurant by the display cases to help publicise the RAA. We have echoed the BAE Systems corporate colours.

The Times' March 4th 1916

War effort

In March 4th 1916 the employees of Elliott Bros gave £10. 0s.6d to the British Red Cross and Order of St John fund for assistance to those wounded. The Joint War Committee was spending £25,000 a week on this effort but donations were not matching this

(£10 in 1916 is the equivalent of £608 today! Ed)

Grave of Charles Elliott

You may recall the pictures in Newsletter 6 of the grave of Charles Elliott, one of the Elliott Brothers who founded our present company. The cross had been taken down for safety reasons. The cost of reinstating the cross and generally tidying up the site is over £1000 so sadly we cannot afford to do it.

Did you try the Brain Teaser in Newsletter 10?

Opposing fighter planes (A and B) were speeding towards each other, each travelling at 800mph in windless conditions. When they were exactly 500 miles apart, plane A launched a target-seeking missile at plane B at 2000mph. When the missile reached the target area the sophisticated electronics on plane B turned the missile round and directed it back at plane A. Plane A had the same technology and returned the missile towards plane B.
The projectile's flight continued backwards and forwards in this way until the two planes collided head-on at the same time as the missile exploded, causing a rain of fine metal fragments.
Ignoring the turning time, how many miles did the missile travel before that disastrous conclusion?

Martin Redfern replied….
In response to your plea, I reckon the Brain Teaser solution might go something like this:

Aircraft closing speed = 1600 mph
Aircraft collide after = (500 miles) / (1600 mph) hours
Missile distance = (2000 mph) x (500 miles) / (1600 mph)
= 10000 / 16 miles
= 625 miles

This assumes the missile virtually touches each aircraft but ignores turning time. Nevertheless, that's some A-A missile! Almost intercontinental :-)

Martin

'The Times' Nov 9th 1957

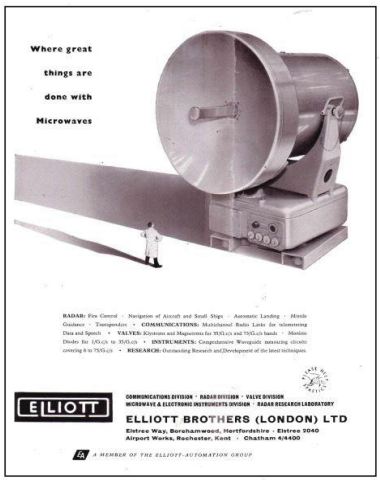
HOODED GANG GRAB £11,762 IN RAID

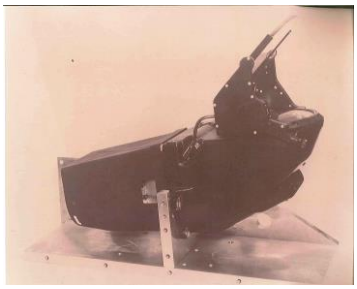
STAFF ATTACKED IN CAR HOLD-UP

Four men, three of them hooded, escaped with £11,762 in Lewisham, S.E., yesterday after ramming with their van a car in which four members of a firm's staff were returning from a bank with money for wages. The gang used pick-axe shafts to attack the employees, two of whom had their wounds dressed in hospital.

The bag containing the money, in £1 notes, had been fitted recently with a new device for sounding a strident alarm. This worked efficiently but the noise failed to attract attention.

It was a daring raid, obviously well rehearsed. The firm concerned, Elliott Bros., electrical and mechanical engineers, of Century Works, Conington Road, Lewisham, send four of their employees every Friday to draw wages money from a branch of Barclays Bank which is five minutes' drive from the factory. Each week the route and the car used are changed as a precaution against robbery attempts.





Integrated Light Attack Avionic System (ILAAS) Head Up Display

This was a key part of our first HUD sales to the US in about 1966 and it led to: A-7D/E, A-4M, F-16A/B/C/D etc.
The ILAAS HUD included a number of technology firsts for us in addition to valuable initial exposure to the US way of doing business. For example, the programme memory that Jim Machin and team developed from scratch was necessary to ensure non volatility and a very wide temperature range (in fact he achieved about -70C to around +120C). The approach used large ferromagnetic cores threaded with a number of copper wires and avoided the ½ current drives of a conventional core stack. In production (for the A-7), a manufacturing source was established in Portugal drawing on their lace making skills. The narrow digital card design was created by Frank Wooller to allow the shortest conduction cooling path to a central "cold wall" heat exchanger. Flat pack integrated circuits, initially DTL and later TTL microcircuits were mounted on aluminium heat sinks bonded to the multilayer cards. Plated through holes interconnected the layers. Incidentally, aluminium was chosen because of its superior conduction capability (by weight) compared to copper. So lots and lots of "firsts"! Today, it could never have happened: assessed risk would have ruled it out.

We drew on our experience immediately preceding ILAAS which was based on the twin Verdan computer system for the TSR2 navigation and attack system. As then, we used a GP processor to control a set of DDAs (Digital Differential Analysers) – essentially, precise digital amplifiers used for navigation on TSR2 and to generate the ramp and sinusoid waveforms driving the display. The PDU was the responsibility of John House in Brian Wolf's team. It had an optical assembly made by Wray Optic (probably the last to do so) which gave a circular total field of view of 25 degrees and used a 6.5inch exit lens. The Pilot's Display Unit was designed at Rochester by a team including John Shepherd and Staff Ellis. (*Notes from Dave Hussey who has recently donated some ILAAS equipment*)

A bit more core information

Paul Balzan is the Son-in-law of the late Mervyn Lea, who ran the QA Dept at Rochester for many years. Paul worked at Elliotts in the 1960's and then joined Plessey who sent him to Malta (he is Maltese) to manage some 800 women making the core planes for Elliott computers and Plessey equipment. Dave Hussey confirmed in the notes above that a manufacturing plant had been set up in Portugal for the lacemakers to make core stores.

(Ed. *I recall in the 1970's coming in to work on a Sunday with a wireman called Colin Ives to reprogram the core stores. This entailed stretching out wires down a long bench and threading them through the ferrite beads in the correct direction to create a '1' or a '0'.)*

We have been around a long time

MARCH 27, 1909. **Aero Show at Olympia.**

'*Last but not least there are the numerous beautifully made instruments exhibited by Elliott Brothers, who have all sorts of devices calculated to assist the experimenter in collecting accurate data as he progresses in the art of flight*.'

OCTOBER 28, 1911. **The Gyro Compass**.

'During the past three years the German navy has been largely replacing the familiar magnetic compass with a gyroscopic instrument developed by Dr. Anschutz, which device is now being made in England by Elliott Bros., and is finding its way on to British ships.

Everyone knows that a gyroscope is a spinning fly-wheel mounted in gimbals, and that its principal characteristic is the manner in which it keeps its axle fixed in space irrespective of the manner in which its supporting framework may be moved around it. It is less generally known that if the framework is so arranged that the gimbals provide for free movement in two instead of three directions in space, a gyroscope will persistently point its axis due north and south.

From the fact that it is electrically driven, may be gathered its unsuitability for aeroplanes in its present form ; nevertheless it behoves aerial navigators to keep their eye on an instrument which is so far superior to the magnetic compass as to indicate a true geographical north and to be absolutely unaffected by the presence of iron and steel in its vicinity.'

(Articles from Flight International)

BAE Systems Our Heritage

Have a look at the Corporate website on the Company Heritage. (Just search on BAE Systems Heritage). As the weeks go by this is being reformatted and populated with lots of information about the Land Sea, Air and Equipment history of the Company.