BAHG Newsletter

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Model 480 Tornado, 8ft tunnel, 1972 (neg B10032-Bk1A)

Model 480/P1216 rear, 13x9, 1985 (neg CL1214)

Fly by Wire Research at RAE Bedford & Farnborough Research into the potential of Fly by Wire as a control technology in advanced combat aircraft has been a major theme at RAE for many years. Gerry Shanks, who worked on this subject at both Farnborough and Bedford, is trying to put together the story, and would appreciate any help that people can give, whether recollections, reports, photographs or other material. Please make contact in the first place via our email at bahg-bt@hotmail.co.uk. Currently, Gerry is trying to unravel the story of the Short SC1 autostabiliser.

Discoveries in the Old Telephone Exchange We had a message out of the blue to say that someone had found some papers in the old telephone exchange on the wind tunnel site – were we interested? We never turn down material being offered so one Friday we collected a box of papers from Adrian Longman who now uses the old telephone exchange building for his auto design business. The box contained a large number of (frankly, uninteresting) telephone circuit diagrams dating from the early 1950s. But among the dross were nuggets of gold – including a file dealing with the Open Day held on 29/30 May 1964, containing a printed Guide to Exhibits and a typed copy of the flying programme commentary.

Enquiry from The Netherlands We recently received an enquiry from The Netherlands via email about our VC10. Jelle Hieminga is a VC10 enthusiast and he has created the web site www.vc10.net devoted to the history of every VC10 ever built. This features our VC10 XX910, formerly G-ATDJ. Jelle wanted to know more about what our VC10 did during its short research life at RAE Bedford. Together with some photographs, he has now added this information to his site (see http://www.vc10.net/Airframes/cn_825_gatdj_xx914.html). Please check it out and send any comments to our usual email.

Enquiry from Norway We received another enquiry via email about our work on Concorde. This came from the Norwegian national museum of aviation (http://luftfart.museum.no/en/) opened in 1994. The museum is located in Bodø in the North of Norway in a building shaped like a giant propeller, and covers military and civil aviation history. Their message reported that they had received a wind tunnel model of Concorde from Airbus. The model (see picture), which is 3.4 m long, is said to have been used for testing at RAE Bedford. They asked us for any pictures of the model in action in the wind tunnel that can be used in the museum. Our reaction at present is that the model was a display model not a tunnel model, as it is too big even for the 13x9 tunnel, but our investigation continues. Any comments welcome.

Gallery Pictures We have done well recently for enquiries and responses to our newsletter. Last month, in 'A Gallery of Memories' we showed two pictures, one captioned "Model 480, Tornado, in 13x9, 1985 (CL1213)" and the other "Future ASTOVL combat aircraft in 8x8 tunnel, 1995 (A10729)". These pictures stimulated a very helpful response from Dr Michael Pryce, Lecturer at the Centre for Defence Acquisition, Cranfield University, Shrivenham. We were already puzzled by the picture of model 480. Mike has clarified that it shows our tunnel model 480 (which was originally a true Tornado model – see picture top left) modified with the twin tail booms (see fresh picture from rear, top right) of the British Aerospace Kingston P1216 project, presumably for comparative tests of high angle-of-attack characteristics. Mike comments that the P1216 was a significant project, and testing was also carried out of a 1/10 scale high speed model at Bedford (BAe designation K22 and, possibly, RAE designation M189). Mike studied the design history of P1216 for his PhD and subsequently wrote a

book on it (http://www.harrier.org.uk/P1216.htm). He also added that the picture included last month, of the 'future ASTOVL' model, shows a joint McDonnell Douglas/BAe design from the mid-1990s.

Appeal for Organisation Charts RAE Departments and Divisions published organisation charts from time to time, showing Sections, people and phone numbers. These provide very useful information, not least in recalling names. We are building up our collection and if anyone has some in a drawer somewhere, we would welcome having them on loan (or to add to the archive) so we could scan them. Some people used to pin new ones over the top of old ones, in this way accumulating a set. We have a good set (though not complete) from Aero Flight, and later Flight Systems, and some from Aerodynamics Dept. BLEU and NAD, however, are not well represented, so your help would be welcome.

Future Display BAHG is planning a display about the work and achievements of RAE Bedford to be put on in the Borough Hall of Bedford Borough Council. This will take place in the Autumn for about 4 weeks. Planning and preparation are in progress.

Talks Since our last issue, Barry Moulang has given a lunch-time talk on Flight Simulation to the Bedford Engineering Lunch Club, and Barry Tomlinson gave an after-dinner talk at the Mill House restaurant Sharnbrook about RAE Bedford. The next talk will be to the Rushden Chichele Rotary Club, by Reg Harlow.

The visit to the Science museum store described in the February issue of the newsletter has stimulated Nick Cooke to write the following brief article.

What Happened to the RAE Speech Recognisers? (by Nick Cooke)

The use of Automatic Speech Recognition (ASR) over the telephone network is today becoming widespread. When RAE Bedford began research in 1981 into the use of ASR, or Direct Voice Input (DVI) as it became known, the idea of 'talking to machines' was novel and some might say, futuristic. Prior to DVI, pilots entered the various items of data - geographic position, cruise levels, speed, frequencies - by means of multi-function keyboards into equipment such as Flight Management Systems. With the constraints of cockpit space, each button on these small keyboards had several modes. Using them was error-prone and time-consuming. Thus, there was a requirement to ease the data entry process and what better for humans than to speak to the equipment?

When RAE Bedford's research started in 1981 by testing available speech recognisers, no UK speech recogniser existed. With funding from the UK Department of Trade and Industry, Marconi Space and Defence Systems at Portsmouth produced the World's first "connected-word" recogniser, the SR128. This particular recogniser was installed in BAC1-11 XX105 in early 1982 and was used to control various systems on board the aircraft. Initially used to control the format of the electronic cockpit displays, the SR128 proved to be sufficiently useful and reliable for it to be interfaced with the radios and then with the Flight Management System. The latter step enabled such voice commands as "Go Direct Charlie Oscar Romeo" followed by the Latitude and Longitude of this new waypoint. Cruise levels could be inserted, requested headings could be flown and speed settings selected, all by voice commands. Listening to the pilot say "Speed two five zero" and observing the throttles re-position to achieve this new speed, was memorable to all visitors that flew on the trials aircraft demonstrations.

Following the research on DVI for civil aircraft, and the success of the BAC 1-11 trials, similar work was undertaken in a military context on board Bedford's Wessex helicopter XR503.

After leaving RAE in 1992 I wondered, as the DVI Project Leader at RAE Bedford from 1980 to 1993, what had happened to the two SR128s installed in XX105 and XR503. When Gordon Ingle, a close friend and RAE colleague, died, I was asked by the executor of his will to look through Gordon's house for items that might be of interest to archives or museums. With 'Danny' Daniels, we looked around Gordon's house and with much surprise we found the two SR128s. Gordon must have purchased these when various items were being sold at public auction. With permission from the executor, I felt that both recognisers should be donated to a suitable museum, especially the BAC1-11 recogniser with its provenance, as the first instance of a connected speech recogniser being used to control civil aircraft systems. My first thought was the Science museum and after a fairly lengthy search for the correct person, the XX105 SR128 was donated to the Science Museum store in central London during September 2005 (see the image above left of the SR128 in the museum store).

As for the recogniser from Bedford's Wessex helicopter, XR503, I thought about the 'inner workings' of the SR128 in deciding a suitable location. In very simple terms, the SR128 attempted to match the input speech with stored coded patterns of speech; in other words a decoding process was taking place inside the recogniser. As soon as I thought about codes, I immediately considered the WWII code breaking centre at Bletchley Park (BP). The second SR128, the World's first ASR to fly and be used in a helicopter, was donated to BP also during September 2005.