



VAAC Harrier at Cranfield prior to first flight after its initial re-build, June 1986 (neg B7452H)



Puma XW241 in 1990 farewell flight in "RAE Raspberry Ripple" colour scheme applied 1986 (negA4501A-11 Feb 1990)

Some RAE Activities in 1990 The editor has chosen to highlight some research activities from 1990, a date already 30 years ago! It is interesting to recall some of the research in progress one year before RAE came to an end and transitioned to being the Defence Research Agency (DRA).

Puma XW241 (with thanks to Barry Moulang for additional material)
Puma XW241 made its farewell to RAE Bedford on 9 Feb 1990 by flying over the tunnel site and Thurleigh airfield (see picture at top). After its arrival in May 1973, XW241 (shown below in the September 1973 photo) was brought up to production standard and fully instrumented for the research programmes.

Its many research activities included helicopter agility trials, illustrated in the dramatic picture, right, of a rapid acceleration test (1973). These agility trials investigated how quickly certain important manoeuvres could be executed and what handling issues influenced their achievement. Other major tasks were dropping free-flight models, including MRCA/Tornado, basic rotor research and tests of advanced rotor blades (part of the British Experimental Rotor Programme, BERP, a joint venture between Westland Helicopters and RAE, described in Newsletter 24, Sept 2016) and measurement of the aircraft's inherent flight dynamics as the basis for the definition of mathematical models used in the flight simulator.



The aircraft is now on display outside the Farnborough Air Sciences Trust (FAST) museum.



Puma XW241 on ground (neg B3500A, 1973)



Puma XW241 airborne, showing the vanes for airflow measurements mounted on a nose boom (neg B6040D 1982)



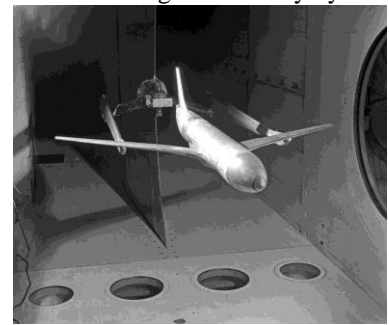
Bjorn Singer and Pete Collins after the flight (neg A4862) The VAAC team - boffins and hangar staff (neg A4866)

Harrier XW175 Following its major re-incarnation at Cranfield (Dec 1983 – June 1986) as the “VAAC Harrier”, XW175 was checked-out progressively for the Fly-by-Wire programme. The first step was to program the flight control computer to represent a “digital Harrier”. This was first flown successfully in May 1990 by Bjorn Singer and Pete Collins (see photo above). The group of boffins and hangar staff celebrating this major milestone are also featured. This successful first engagement in flight of the FBW system led ultimately to the definition and adoption of the final “unified” flight control configuration now operational in the Lockheed Martin F-35B being flown today by the RAF and RN. It’s salutary to recall that this research, begun 30 years ago, is only now reaching operational service.

8x8 Wind Tunnel Over the years, a number of Airbus models have been tested in the 8ft wind tunnel, particularly to check out the wing design. The picture, right (neg A4701, March 1990) shows one such model, probably for an enhanced member of the A320 family.



Eurofighter EFA models were also tested, for both the UK and the partner nations, to check clean aerodynamic performance and also configurations with stores, left (neg A4875, May 1990).



BAC 1-11, XX105, Flight Management Research (by Reg Harlow) 1990 was another busy year for the Civil Avionics Section’s BAC 1-11 XX105. Data Link trials were conducted with both Eurocontrol and the Royal Signals and Radar Establishment at Malvern. Navigational accuracy comparisons were made using a Racal Flight Management System (GPS) and an in-house system known as “Data Puddle”. This task included two detachments to the Azores via Portugal, returning via Spain. Development and flight testing of an in-house Digital Autopilot was also successfully

completed. An unusual trial with the National Air Traffic Services (NATS) involved climbing to FL340 behind one of their radio-sonde balloons, released from Hemsby, to compare the wind speed and direction provided by the balloon with that determined by the on-board navigation systems. The picture, right (neg A5364, Nov 1990) shows the aircraft’s CRT displays giving Primary Flight and Navigation (map) data, the Data Link display screen (above the throttles), the Digital Autopilot Controller (above the Data Link display) and the Racal Control and Display Unit (on the left side of the centre console).



New Book Mike Dobson has produced a new book, about Thurleigh airfield *before* it became RAE Bedford. As Station 111 during World War II, Thurleigh was the home of the American 306th Bomb Group operating B-17 bombers over Germany from early 1942. The book notes that, then, as now, the airfield was prone to fog and thus posed major challenges to aircraft returning from a raid, and recounts how landings were aided by making use of the spire of Keysoe Church, often poking up through the fog. Entitled “United States Army Air Force Station 111, Thurleigh, 1942 to 1945”, the book is available from Mike (contact via mike@mddobson.co.uk) at a cost of £5 plus postage.