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XG900 ready to leave Bedford (neg B2997D)

XG900 arriving at the Science Museum, cover of RAE News Vol 24, No 7, July 1971

Bedford Research Aircraft – Short SC1 (by Barry Tomlinson, with help from William Sargeant & Barry Moulang)

Fifty years ago, on 10 May 1971, Short SC1 XG900, carried on two low-loaders, left RAE Bedford for London, on the way to the Science Museum. The formal handover was made by RAE Director Sir Morien Morgan on 22 June 1971 (see the July 1971 issue of RAE News).

The Short SC1 was the UK's first jet VTOL aircraft: two examples were built, XG900 and XG905, and were used at Bedford for research into vertical take-off and landing from 1959 to 1973. XG900 made its first conventional flight (at Boscombe Down) on 2 April 1957, but without lift engines. XG905 made its first free hover at Belfast on 25 October 1958. XG900 came briefly to Bedford in Jan 1959, returning in Jan 1961, while XG905 arrived late in 1959.

The SC1 employed the Rolls-Royce concept of multiple lift engines and a separate propulsion engine. An early accomplishment was the first transition from hover to forward flight and back, achieved by company test pilot Tom Brooke-Smith flying XG905 at Bedford on 6 April 1960. Demonstration to the press was given in June.

XG900 was flown to the 1961 Paris Air Show from Bedford via Stansted, Manston, Coxyde, Epinoy and Senlis, sometimes doing vertical landings. So many stops were necessary as it could fly for only 30 minutes. Pilots were Denis Tayler (former civilian TP at Bedford, then Chief Pilot at Shorts) and Alex Roberts. Two pilots from NASA flew XG900 at Bedford in June 1962: Jack Reeder (Langley) and Fred Drinkwater (Ames). French test pilots also came to Bedford to fly the SC1 in 1962 (left, *neg B296*, with Bedford staff), presumably to gain some experience before flying the Balzac V test bed later that year and the Mirage IIIV in 1965 – both also using RB108 engines.

Among the research tasks undertaken by XG900, a challenging one was flying into a restricted site, known as the "hole in the wood" (above right, *neg B2233D, 1967*), an exploration of issues relevant to the potential operation of VTOL airliners to city-centre sites. The last picture of XG900 in flight at Bedford is dated 16 Oct 1968 (left, *neg B2496H*), after which the aircraft was set up on the inertia rig. When last seen by the writer, in 2014, XG900 was on display in London's Science Museum, and hung rather ignominiously on the wall, with only one wing.

XG905, while at Belfast to be fitted with a new auto-stabiliser, was involved in a fatal accident on 2 Oct 1963. After a major re-build, and improvements, the aircraft returned to Bedford in 1968. Its research tasks included the study of head-up displays for VTOL flight. NASA test pilot Jim Patton came to fly the aircraft in Aug/Sept 1971 (right, *neg B3045B*, with William Sargeant and TP Ken Robertson). After its last flight (by Ron Ledwidge) at Bedford on 10 May 1973, XG905 moved to the Ulster Transport Museum near Belfast, where the two SC1s were built.

Another VTOL milestone at Bedford occurred on 13 March 1961, with the first conventional flight, by company chief test pilot Bill Bedford, of the Hawker P1127 prototype XP831 that evolved into the Harrier.

All Change 1991 RAE ceased to exist in 1991, becoming the Defence Research Agency. More on this in the next issue.

Comet 3B XP915 Incident "It was very nearly curtains" – Nick Cooke (assisted by Steve Martin) recalls the story

On 19 January 1971, just over 50 years ago, the title of this article was very close to becoming a reality, when Comet 3B XP915, operated as a flying laboratory by the Blind Landing Experimental Unit (BLEU) was involved in an incident with a BEA Trident aircraft landing at RAE Bedford.

XP915 started its life as G-ANLO, rolling off the assembly line on 4 May 1954. After a period of flying as the main test aircraft for the Comet 4, in the hands of John Cunningham and Peter Bugge, XP915 was modified by reducing the wing span and removing the pod tanks, flying in this form on 21 August 1958. Now identified as a unique Comet Mk 3B, it was finally delivered, in this form, to BLEU on 20 June 1961 (right, on arrival, *neg C6477*) and became one of the workhorses of BLEU for the next eleven years, mainly testing new autoland systems.

My first flight on XP915, as a Flight Test Observer, was on 11 September 1968, investigating new autoland control laws. For this, we used a PACE TR 48 analogue computer, the only practical solution at the time, as digital computers were too large for the aircraft cabin, and also too slow in response time.

The flight on 19 January 1971 was to investigate new pitch control laws provided by the TR48 as a Versatile Auto Pilot. The events that followed were noted in my Aircrew Flying Log Book. A full report of the accident can be found on the Internet. XP915 taxied from the BLEU apron to runway 27 at Bedford. Air Traffic Control cleared XP915 to enter the intersection with runway 27 and runway 24 after a Boeing 707 had over-flown. XP915 was given clearance to backtrack along runway 27, then to line up and hold near the runway threshold. XP915's flight crew, captain Flt Lt Jake Barclay, co-pilot Ian McGrath (BEA) and flight engineer Flt Lt Bob Anstee along with the two Flight Test Observers, Tim Asbery and myself, plus John Holton (ATC) and Brian Cole (Senior Met Officer) were aware that an aircraft was on the approach and would be overshooting the runway. I saw the approaching aircraft through the cabin window, whilst our aircraft was in the process of turning at the end of runway 27. I estimated it as approximately 3 miles out and at a height of 1500 ft. I was positioned at the back of the cabin, approximately where the RAF roundel is seen in the picture above. My notes also suggest that we lined up and held about 300 yds past the runway threshold.

XP915 after the accident. The dashed line indicates the original fin height (neg B2908L)

Damage to Trident 3B G-AWZA parked outside BLEU hangar after the accident (neg B2908J)

Waiting for clearance to take off, we heard the engine noise of the approaching aircraft and then felt the impact. Metal fragments floated past the cabin windows. From lining up to impact was recorded as 2 to 3 minutes. The approaching aircraft, a Trident 3B registration G-AWZA, making an approach to runway 27 and using the Instrument Landing System for crew training purposes, had removed part of XP915's fin! Flt Lt. Barclay decided to clear the runway immediately, as the Trident might need to make an emergency landing, and then, owing to a danger of fire to XP915, it was decided to shut down the engines and the aircraft systems. RAE Bedford's Fire Department was on the scene within three minutes of the impact. I remember that we evacuated the aircraft by means of one of the Fire Department's ladders. It was only after evacuating the aircraft and viewing the missing fin that I realised what a close call it had been.

XP915 was towed back to the hangar and a repair process commenced to make it airworthy again, not an easy task, as spares for a Comet were not plentiful! Eventually, a suitable fin was found on an un-airworthy Comet C2, originally registered as XK716, located at RAF Halton, Buckinghamshire, being used by 1 School of Technical Training. Steve Martin, an RAE Bedford apprentice at the time, was part of a working party detached to RAF Halton for a few days. He recalls that they had to remove the curved top fin from the Halton Comet and replace it with a dummy flat-topped wooden fin. The BEA Trident was repaired by a joint Hawker Siddeley - BEA team and flown back to Heathrow.

XP915 resumed flying on 10 June 1971, some 5 months after the accident. The aircraft acted as a flying laboratory for the next 10 months before being retired on 30 March 1972. It was replaced by a more representative modern aircraft, BAC 1-11 XX105.