

Biggin Hill Kingcobra accident analysis



TFC's P-63A Kingcobra 269097 at Flying Legends, Duxford, 1999. Its crash report was published on April 4. KEY—DUNCAN CUBITT

UK AIR ACCIDENT Investigation Branch, based at Farnborough, Hants, published its findings on the fatal crash on June 3 last year of The Fighter Collection's Bell P-63A Kingcobra 269097 (G-BTWR) during the Biggin Hill International Airshow on April 4. Readers will remember that on the day previously, a de Havilland Vampire had crashed at the show, killing two. The report on this accident has yet to appear.

The following is extracted from AAIB Report EW/C2001/6/4 with our many thanks to the AAIB.

The P-63's pilot (aged 43) who was killed in the impact had 7,730 hours flying experience of which 13 were on type. The pilot had trained to fly with the RAF and had been a member of the 'Red Arrows' display team for three seasons. Post-RAF he flew for a display team operating Pitts Specials and then as an airline pilot.

From 1998 he had flown a number of historic aircraft on an occasional basis. He first flew the P-63 in April that year.

In accordance with his CAA Display Authorisation he was required to carry out at least three display sequence practices, one in the same category of aircraft, in the 90 days preceding a display. During the required period the pilot had flown 30 minutes dual in a Harvard, 25 minutes of display practice in the P-63 on June 1 and the airshow display of the previous day. Relevant display practices were not recorded in the pilot's logbook but were recorded as having been carried out by the aircraft operator's organisation.

After a hold of 15 minutes, the P-63 and two other 'warbirds' took off at

Biggin Hill on June 3 for their part in the display. They held for three minutes and then commenced their routine. They ran in together and each performed a loop followed by a half Cuban eight.

After this, the P-63 broke away from the other two as planned ready for a 'slot' that would fill in between the other two aircraft. The routine was to include some vertical manoeuvres but, unlike the first two aircraft, the P-63 was not flying a pre-planned sequence.

One minute after the break-away, after performing a flypast along the display line at a measured 220 knots and having passed opposite the other two aircraft, the P-63 was seen to pull up into a rolling, climbing manoeuvre. At the top of this, with the aircraft partially inverted, the pilot appeared to lose control and entered an incipient spin. He recovered the aircraft, having lost considerable height, and continued his display.

He next flew past the crowd, carried out a wing-over and returned past the crowd at 190 to 195 knots. The P-63 then went out of view for some 20 seconds, in which time it was turned to the right through some 220 degrees, before running in directly towards the crowd and pulling up into the first half of a loop.

At the top of this manoeuvre, in the inverted position, full nose-up elevator was maintained and a substantial amount of right rudder was applied. The P-63 yawed to the right and then departed into an upright incipient spin. The nose dropped steeply, full nose-up elevator was maintained and

the rudder returned to neutral. The aircraft did not recover from the ensuing dive. From take-off, the flight had lasted seven minutes.

The airshow had a Flying Display Committee and a Flying Display Director, the latter having the responsibility for control and modification of the flying programme. Communication with air traffic control – on the opposite side of the runway from the crowd line, was by radio or telephone.

During the P-63's display, a committee member was concerned by the loss of control at the apex of the first vertical manoeuvre and attempted to contact ATC five times by radio and the Display Director twice, but was unable to get an answer. After the accident, the event organisers installed a direct telephone line between the Flying Display Committee and the Display Director in the ATC tower.

AAIB was helped considerably in its investigations from photos and video footage from spectators. The unsuccessful manoeuvre, two minutes before the accident, was clearly recorded on video. The recovery and all the other manoeuvres until the final one appear to have been conducted normally but at slower speeds than might be expected.

Pathology showed no evidence of a pre-existing disease, medical condition or toxicological impairment that might have contributed to the accident. Examination of the wreckage showed no evidence of any failure of within the engine; likewise the propeller.

The extensive break-up of the

airframe precluded an assessment of the possibility of a flying control restriction due, for example, to a loose article, but there was no evidence of any pre-impact disconnection.

To quote directly from the 'Discussion' element of the report: "It is difficult to understand why the pilot, who was experienced and practised in the display environment, continued with his display after experiencing a departure from controlled flight during one of the manoeuvres." The report notes that as the flight was taking place at a large public display, "it is relevant to consider the extra psychological pressures this could have exerted".

Because of the constant need to check the positions of the other two aircraft and his own position with reference to the display line, the display task of the P-63 pilot was more difficult than a solo display.

Analysis of video footage showed that the final manoeuvre was probably entered with insufficient speed for it to be completed successfully. The 'Discussion' section concludes:

"The flight control inputs at the top of the final manoeuvre, in particular the rudder, were not consistent with a display manoeuvre or a recovery action. In fact, they were similar to the control positions used to effect deliberate entry into a spin and the aircraft entered an incipient spin. From consideration of the evidence and the experience of the pilot, it seems likely that an unknown factor affected the pilot's physical and/or mental performance during the display." KE