MINISTRY OF DEFENCE

Military Aircraft Accident Summaries

9/88

October 12, 1988

AIRCRAFT ACCIDENT TO ROYAL AIR FORCE TORNADO GR1 ZA366

Date:	3 June 1987
Parent Airfield:	RAF Honington
Place of Accident:	Manby, Lincolnshire
Crew:	Two
Casualties:	2 Major Injuries

CIRCUMSTANCES

1. On 3 June 1987 a Tornado Weapons Conversion Unit (TWCU) student pilot took off from RAF Marham (where he was on detachment from RAF Honington) briefed to fly his first sortie in the TWCU syllabus. He occupied the front cockpit and his instructor - the aircraft captain - the rear. The initial part of the sortie was uneventful but, after 17 minutes, whilst at a height of 280 ft and 420 knots the crew heard a loud, explosive bang apparently coming from the right side of the aircraft. Immediately following the bang, the student reported a Right Engine Vibration caption on the warning panel. He throttled back to approximately 75-78% RPM and the caption went out.

2. Forty three seconds after the bang, the Auxiliary Power Unit caption illuminated. The captain told the student to turn left

towards the nearest airfield and to climb. At this point their problems were further compounded by a complete Command Stability Augmentation System (CSAS) failure - which failed to reset - and a loud distracting noise which had persisted from the time of the bang. In response to the noise and the general circumstances of the emergency, the student shut down the right hand engine and reheat was engaged on the left engine.

3. The captain put out a MAYDAY call and the aircraft was levelled off just below the cloud base at about 2000 ft and pointed in the direction of the nearest airfield, RAF Binbrook. However, given the handling condition of the aircraft, the student was unhappy to attempt a landing at RAF Binbrook because he felt that he needed a longer runway with a better into wind component to attempt a landing. The captain agreed, and it was established that the wind at RAF Coningsby with its longer runway was within limits for a fully failed CSAS landing. Their range from RAF Coningsby was 40 miles.

4. The student next reported several other warning captions. This was acknowledged by the captain but before any further action could be taken, the student announced that he had lost control of the aircraft which was rolling to the left. The student applied full right taileron but the aircraft continued to roll uncontrollably so he initiated crew ejection. Both ejection sequences were normal

although the student suffered a spinal crush fracture and the captain a fracture dislocation of the left shoulder which were classed as major injuries. Following the ejection the aircraft continued to roll left with the nose gently dropping before it impacted on a disused airfield, formerly RAF Manby, forming a single crater on the edge of a taxy track.

CAUSE

5. From the wreckage it was found that there was widespread heat damage at the rear of the fuselage, partially from ground fires but with evidence of an airborne fire. Components from the CSAS were to damaged for analysis. What little remained of the mechanical control linkages indicated heat damage ranging from discolouration of components from the aircraft spine to partial melting of the right hand taileron controls' torque shaft. Together with the severe damage to the surrounding structure, the melting accounted for the pilots' increasing difficulty with flying the aircraft and the eventual loss of control.

6. A fire extinguisher bottle, located below the right hydraulic reservoir and just forward of the taileron, had been subjected to a temperature in the region of 900 deg C, sufficient to soften or even melt its brass head. This temperature was consistent with that of an intense fire or fuel or hydraulic fluid.

7. Reconstruction of the rear fuselage and analysis of component temperatures established that an intense fire broke out in the

rear fuselage which was intense enough to disrupt all the flying controls, electrical and electronic systems exposed to it. It was concluded that the most probable cause of the fire was a fine spray leak of hydraulic fluid onto either a hot Environmental Conditioning System duct or a damaged piece of electrical wiring.

SUBSEQUENT ACTIONS

8. The Design Authority is investigating the replacement of the flying control rods with rods made from a more heat resistant material. The RAF is also examining the practicability of wrapping selected hydraulic unions so that any leaks are reduced to detectable drips instead of spraying a combustible vapour.

CLAIMS

10. Compensation totalling £6,845 has been paid by the Ministry of Defence in respect of damage caused by this accident.

Issued by: Public Relations
(Royal Air Force)
Ministry of Defence
Main Building
Whitehall
London SW1A 2HB
Tel: 01-218 3253/3254