MINISTRY OF DEFENCE

Military Aircraft Accident Summaries

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AIRCRAFT ACCIDENT TO ROYAL AIR FORCE TORNADO GR1 ZA494

Date:	18 July 1984
Parent Airfield:	RAF Marham, Norfolk
Place of Accident:	Goose Bay, Canada
Crew:	Two
Casualties:	One major injury

CIRCUMSTANCES

1. Tornado ZA494 was one of a number of Tornados detached to Goose Bay, Canada, to carry out tactical training. On the morning of 18 July 1984 it took off as No 2 out of a 6 aircraft formation on a low level training mission carrying external stores on all underwing stations. The flight proceeded normally until the aircraft returned to Goose Bay when the pilot of Tornado ZA494 selected the slats and flaps down prior to landing; the slats extended correctly but the flaps did not lower. The pilot re-selected the flap lever several times and cycled the wing sweep in an attempt to obtain some flap, but without success. He elected to land the aircraft with full slat and no flap and positioned for a long straight approach to the runway.

2. Initially, Tornado ZA494's approach to the runway was very steady but at about 200 ft the right wing dropped slightly, as if in turbulence. The pilot attempted to correct this but the aircraft quickly started to roll uncontrollably. The pilot decided not to attempt to land and selected full reheat on both engines to climb away. However, it became obvious to both crew members that the aircraft was going to hit the runway in an extreme attitude

3. Tornado ZA494 struck the runway heavily, bounced back into the air and climbed steeply before rolling and descending, inverted, to crash into woods close to the runway. Both ejections were successful. The navigator was uninjured, the pilot landed on the runway itself suffering a fractured clavicle and some bruising.

CAUSE

4. Despite extensive examination of the aircraft wreckage, it was not possible to determine positively the cause of the initial flap failure. However, from a mathematical modelling exercise using the Accident Data Recorder (ADR) printout, it was established that the aircraft controls became unsynchronised with the pilot's inputs to correct roll at a late stage during the approach to land. Following this unusual technical failure a trial sortie was flown in the accident configuration. this revealed that, following a failure of the flaps to lower, it was possible, in certain conditions of cross-wind and turbulence, and with heavy underwing stores, for the aircraft to be susceptible to loss of control in roll. It was concluded that the wind conditions at Goose Bay, combined with the aircraft's abnormal configuration and heavy underwing stores, had resulted in the aircraft entering a manoeuvre from which it had not recoverd.

SUBSEQUENT ACTIONS

5. New procedures have been adopted for a flap failure which reduce the possibility of unsynchronised control. In addition, effective recovery actions to cope with such a situation have been devised and promulgated to Tornado aircrew.

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