



MINISTRY OF DEFENCE

Military Aircraft Accident Summary of a Royal Air Force Board of Inquiry

Aircraft:	Tornado F3s ZE166 and ZE862
Date of accident:	10 January 1996
Place of accident:	8nm west of RAF Coningsby, Lincs.
Casualties:	2 major and 2 minor

Synopsis

1. ZE862 and ZE166 were Nos 2 and 3 of a formation of three Tornado F3s carrying out an Operational Conversion Unit (OCU) sortie that was to include evasion and Air Combat Training (ACT). The first phase of the sortie was under way when they collided. As a result of damage sustained in the collision, the two aircraft became uncontrollable and both crews ejected. The aircraft crashed onto open ground at separate locations some five miles apart. The Inquiry concluded that the accident was caused by the pilot of ZE862 who did not adhere to the Standard Operating Procedures and attempted to engage ZE166 without first ensuring visual contact. In addition, the Inquiry concluded that the pilot of ZE166 did not manoeuvre sufficiently to avoid the collision.

Background

2. The sortie was planned as one of the conversion sorties on the OCU short course syllabus for the benefit of the pilot of ZE862, an experienced air defence pilot who had recently returned from an overseas exchange tour and was converting to the Tornado F3. His instructor, and the crews of the other two Tornados, were OCU staff aircrew. The pilot of ZE862 had progressed through the syllabus and had successfully completed five 1v1 sorties. This was the

first in a series of 2v1 sorties aimed at introducing him to the techniques required when two Tornado F3s co-ordinate an attack on a single target. ZE166 was acting as the target aircraft.

Circumstances

3. ZE166 took off five minutes ahead of the other two aircraft in order to set up the first engagement, the crew establishing the aircraft in a pre-arranged orbit at 11,000 feet at the southern end of the operating area. Shortly afterwards the other two Tornados arrived, as planned, at the northern end of the operating area in a line abreast formation at 15,000 feet. The weather was good, with cloud tops at 3,000 feet and unlimited visibility above. In accordance with normal operating procedures, all three crews made a brief radio transmission to confirm that they were in the operating area and that they were ready for the first engagement.

4. ZE166 then began to simulate the first attack, acquiring on its radar both of the other two aircraft, which had started to descend in order to engage it. Once the opposing aircraft had closed to a distance of 5nm, the crew of ZE166 carried out a simulated missile attack on the left-hand aircraft (No 1 in the formation). Shortly afterwards, the crew of ZE166 saw ZE862, which was still descending, and the pilot began to manoeuvre his aircraft in an attempt to carry out a simulated missile attack on it. He quickly realised that this was not going to be possible and attempted to manoeuvre away but the two aircraft collided right wing to right wing. The pilot of ZE862 initiated a command ejection and due to the large dynamic forces of roll, pitch and yaw induced as a result of the damage to the aircraft, both crew members sustained major injuries. The pilot of ZE166, similarly unable to control his aircraft, also initiated a command ejection and, as the dynamic forces on them were not as great as those on the crew of ZE862, the crew of ZE166 sustained only minor injuries.

Aircraft damage

5. As a result of collision, ZE862 lost approximately two-thirds of the right wing and two to three feet of the right taileron while ZE166 lost three to six feet of the right wing. Both aircraft were destroyed on impact with the ground, although some parts were recovered for examination by the Inquiry.

Rescue operation

6. Immediately after the accident, two RAF Search and Rescue (SAR) helicopters were scrambled and, using the aircrew's Pye Locator Becons, were able to pick up safely all four aircrew and transport them to hospital. The navigator of ZE862 was subsequently transferred to a specialist care unit by one of the SAR helicopters.

Investigation

7. The Inquiry was able to draw on information contained in the Accident Data Recorders of both Tornados and the statements of all three crews. It was able to establish that both aircraft had been serviceable up to the point of impact and therefore directed its investigations towards the human factor elements. The Inquiry established that, though he had a radar lock on ZE166, the pilot of ZE862 had not made visual contact with the aircraft and that, in spite of this, he descended below the lower boundary of his sanctuary height (12,000 feet), only seeing ZE166 around half a second before impact. For his part, the pilot of ZE166 overestimated his range from ZE862 and, as a consequence, his break away manoeuvre was not of the urgent nature it should have been. The investigation therefore concluded that the accident was caused by the pilot of ZE862, who descended out of his sanctuary height without maintaining an adequate lookout, and the pilot of ZE166 who did not manoeuvre his aircraft sufficiently to avoid the collision.

Safety recommendations

8. A review of rules and regulations pertaining to sanctuary heights in evasion training and ACT has been carried out. In addition, modifications are being made to aircrew equipment assemblies in order to further improve the protection given to aircrew in the event of an ejection being required during high-energy manoeuvres.