AIRCRAFT ACCIDENT REPORT No 5/2010

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REPORT ON THE ACCIDENT BETWEEN GROB G115E (TUTOR), G-BYXR and STANDARD CIRRUS GLIDER, G-CKHT AT DRAYTON, OXFORDSHIRE 14 JUNE 2009

Registered Owner and Operator	1. VT Aerospace Ltd/ Royal Air Force 2. Private owner
Aircraft Type	1. Grob G115E (Tutor) 2. Standard Cirrus glider
Nationality	1. British 2. British
Registration	1. Tutor G-BYXR 2. Glider G-CKHT
Place of Incident	Drayton, Oxfordshire
Date and Time	14 June 2009 at 1317 hrs (All times in this report are UTC)

Synopsis

A Grob 115E Tutor aircraft, operated by the Royal Air Force (RAF), was undertaking a cadet air experience flight from RAF Benson. The visibility was good and the aircraft was conducting aerobatics, in uncontrolled airspace, when it collided with a glider. The left wing of the Tutor struck the fin of the glider causing the tail section to break away. The glider pilot parachuted to safety. The Tutor entered a spiral / spinning manoeuvre before diving steeply into the ground. The Tutor pilot and cadet were both fatally injured.

The Tutor pilot had a long term medical condition which restricted the movement of his head and affected his ability to conduct an effective look-out; this condition also made him more vulnerable to impact fractures of the spine. Following the collision it is probable that the Tutor remained controllable, suggesting that the pilot had become incapacitated.

The cadet's harness had been released and the canopy operating handle had been moved to the open position before the Tutor impacted the ground. The canopy jettison mechanism had not been operated.

The accident was notified to the Air Accidents Investigation Branch (AAIB) at 1350 hrs on 14 June 2009 and an AAIB field investigation was commenced immediately. The investigation was conducted by:

Mr P Claiden	Investigator-in-charge
Mr A Blackie	Operations

Mr B D McDermid	Engineering
Mr M Ford	Flight Data Recorders

The investigation identified the following causal and contributory factors:

Causal factor

1. Neither pilot saw each other in sufficient time to avoid the collision.

Contributory factors

1. The Tutor pilot's medical condition, Ankylosing Spondylitis, limited his ability to conduct an effective look-out.

2. The high density of traffic, in an area of uncontrolled airspace, increased the risk of a collision.

Thirteen Safety Recommendations have been made.

Conclusions

The Tutor pilot was conducting air experience flights for Air Cadets from RAF Benson and the glider pilot was flying a 300 km task that had been suggested by his gliding club. At the time of the accident both aircraft were operating in an area which was relatively congested due to the good weather conditions on the day and the constraints of the local airspace.

The Tutor pilot was conducting aerobatics and the glider was on a constant track when the mid-air collision occurred and the evidence indicates that the Tutor pilot did not see the glider before he pulled up into a vertical manoeuvre. Whilst the glider pilot became aware of the Tutor, and attempted to take avoiding action, he was unable to prevent the collision.

It is probable that the Tutor pilot's long term medical condition, Ankylosing Spondylitis, restricted the mobility of his head, and therefore affected his ability to conduct a look-out to the RAF standard. His medical condition also resulted in his spinal column becoming fused, making it more vulnerable to fracture from trauma.

There was no evidence that any part of the glider had penetrated the cockpit of the Tutor and the aircraft was assessed as capable of controlled flight following the collision. The apparent lack of recovery of the aircraft, or abandonment action by the pilot, led to the conclusion that he was probably incapacitated during the collision. Following the collision, the Tutor probably entered a spin from which it recovered, before diving steeply to the ground.

Following the collision the cadet released his QRF and moved the canopy operating handle to the open position. Although he had been shown the Tutor passenger safety video, the red 'jettison' handle had not been removed from its housing, which is the first action required to jettison the canopy prior to abandoning the aircraft.

Findings

General

1. The Tutor and glider were serviceable prior to the mid-air collision.

2. The mass and centre of gravity of both aircraft was within the prescribed limits.

3. The Tutor and glider pilots were properly licensed and held the required medical certificates.

4. At the time of the accident the weather was fine with visibility in excess of 25 km.

The mid-air collision

5. The glider pilot was flying at a constant speed and on a constant heading just prior to the collision.

6. The Tutor pilot had completed at least two aerobatic manoeuvres before the collision.

7. The Tutor was on a constant closing bearing with the glider just prior to the collision.

8. The Tutor pilot was flying the aircraft from the right seat.

9. The glider was in the Tutor pilot's field of view, but might have been hidden by the windscreen frame.

10. The glider pilot sighted the Tutor below him and took evasive action in an attempt to avoid the collision.

11. The Tutor pitched up into a vertical manoeuvre and the outer section of the left wing struck the fin and right tailplane of the glider.

12. The tail section of the glider broke away causing the glider to become uncontrollable.

13. The glider pilot opened his canopy and parachuted safely to the ground.

14. The impact of the collision probably fractured the Tutor pilot's spine, leaving him incapacitated.

Post-collision

15. The Tutor probably entered a spin immediately after the collision.

16. The Tutor exited the spin in a steep dive, from which it did not recover.

17. The Tutor's longitudinal static stability, although weak, is within the required limits.

18. The damage sustained by the Tutor during the collision would not have prevented it from being recovered from the spin and steep dive.

19. It is unlikely that the cadet would have been able to recover the aircraft from the spin.

20. The Tutor's canopy red 'jettison' handle (locking lever) had not been removed from its housing.

21. Even if he had used the correct procedure, it is unlikely that, in the time available the cadet could have successfully abandoned the aircraft.

22. The impact with the ground was not survivable.

The Tutor pilot

23. The Tutor pilot had Ankylosing Spondylitis, which affected his ability to conduct an effective look-out to the RAF standard.

24. The Tutor pilot had an increased risk of developing a fracture of the cervical spine.

25. An entry, dated 1976 in the Tutor pilot's medical records, stated that he should not undergo parachute training involving falls, due to the risk of fracture to his spine.

26. The Tutor pilot was not restricted from flying aircraft equipped with parachutes.

27. Specialist reports in the Tutor pilot's medical records stated that his Ankylosing Spondylitis was effectively 'burnt out' (not likely to deteriorate further).

28. The Tutor pilot's medical records included a comment that in certain types of aircraft he would have difficulty with vertical look-out.

29. The Tutor pilot's FMed4 folder, containing his medical records, was not reviewed when his medical examination was carried out in 2005.

30. The increased vulnerability for the Tutor pilot's spine to fracture was not identified during the medical examinations undertaken at RAF Benson since joining the AEF in 2005.

31. The Tutor pilot's ability to conduct a look-out to the RAF standard was questioned by instructors at 115 Squadron during his instructional technique course.

32. The Tutor pilot's inability to conduct an effective look-out to RAF standards was not identified during flight and cockpit checks undertaken by the AEF.

The Cadet

33. The accident occurred on the cadet's second flight in a Tutor.

34. The cadet was shown a safety video on the morning of the accident on how to abandon the Tutor.

35. The safety video emphasised that cadets should follow the pilot's instructions, including those relating to the abandonment of the aircraft.

36. Several cadets who were also shown the safety video were unsure as to how to jettison the aircraft's canopy.

37. The cadet released his harness and probably opened the canopy after the aircraft collided.

Airspace and traffic management

38. Air experience flights conducted by 6 AEF normally lasted 25 minutes and routinely included some aerobatic manoeuvres.

39. Flight duration constrained the areas in which the Tutors could operate.

40. The Tutor and the glider were both operating in the Oxford AIAA, in the airspace (gap) between RAF Brize Norton CTR and RAF Benson ATZ.

41. Traffic levels in the 'gap' at the time of the collision were very high.

42. RAF Benson ATC broadcast a message that there was intense gliding activity in the local area during the time the Tutor pilot was in his aircraft.

43. The message from RAF Benson ATC regarding the gliding activity was not passed to the AEF supervising officer.

44. The aircraft were operating outside controlled airspace and neither was in receipt of an air traffic service.

45. There was no onboard traffic alerting system fitted to the Tutor.

46. The FLARM system fitted to the glider was not designed to detect the transmissions from the transponder fitted to the Tutor.

47. Both aircraft were relying on the 'see-and-avoid' principle for collision avoidance in an area of high traffic density.

Safety Recommendations

The following Safety Recommendation was made on 21 July 2009:

Safety Recommendation 2009–079

It is recommended that 1 Elementary Flying Training School of the Royal Air Force review the passenger safety brief relevant to the Grob GE115E (Tutor) to ensure that passengers are briefed on the circumstances when the harness Quick Release Fitting may be released and the procedure to operate and jettison the canopy, when sat in the aircraft immediately prior to the flight.

The following Safety Recommendations were made in this report

Safety Recommendation 2010–032

It is recommended that the Royal Air Force standardise the terminology used to describe the canopy 'jettison' handle (locking lever) fitted to the Grob 115E (Tutor) in order to avoid confusion and to clarify its function.

Safety Recommendation 2010–034

It is recommended that the European Aviation Safety Agency review the certification of the canopy jettison system on the Grob 115 E, to ensure that it complies with the requirements of CS 23.807 with specific regard to the jettison characteristics up to V_{DO} and simplicity and ease of operation.

Safety Recommendation 2010–035

It recommended that the Royal Air Force consider standardising the position and operation of the D-ring on parachutes used in Tutor, Viking and Vigilant aircraft.

Safety Recommendation 2010–036

It is recommended that the Royal Air Force ensure that the medical history of pilots is reviewed when they initially apply to join an Air Experience Flight.

Safety Recommendation 2010–037

It is recommended that the Royal Air Force ensures that all medical limitations relating to Air Experience Flight pilots are recorded in their F5000 (record of flying training).

Safety Recommendation 2010–038

It is recommended that the Royal Air Force review their policy on pilots flying with Ankylosing Spondylitis.

Safety Recommendation 2010–039

It is recommended that the Royal Air Force review their policy for the retention of the complete flying training records of Volunteer Reserve pilots, so that they are available to their supervising officers.

Safety Recommendation 2010–040

It is recommended that 1 Elementary Flying Training School review their risk assessment for Air Experience Flight aircraft operating in areas of high traffic density.

Safety Recommendation 2010-041

It is recommended that the Civil Aviation Authority, in light of changing technology and regulation, review

their responses to AAIB Safety Recommendations 2005-006 and 2005-008 relating to the electronic conspicuity of gliders and light aircraft.

Safety Recommendation 2010-042

It is recommended that the Civil Aviation Authority liaise with the Sporting Associations and the Ministry of Defence, with a view to developing a web-based tool to alert airspace users to planned activities that may result in an unusually high concentration of air traffic.

Safety Recommendation 2010–043

It is recommended that the Royal Air Force review the communication procedures between military Air Traffic Control units and Air Experience Flights to ensure that the supervising officer is made of aware significant changes to the local flying environment.

Safety Recommendation 2010–065

It is recommended that the Royal Air Force review their policy concerning cockpit checks undertaken to support medical assessments.