DH82A Tiger Moth, G-AHMN, 29 May 2000 at 1444 hrs

AAIB Bulletin No: 8/2000 Ref: EW/G2000/05/20 Category: 1.3

Aircraft Type and Registration:	DH82A Tiger Moth, G-AHMN
No & Type of Engines:	1 De Havilland Gipsy Major 1 piston engine
Year of Manufacture:	1939
Date & Time (UTC):	29 May 2000 at 1444 hrs
Location:	Middle Wallop Airfield, Near Andover, Hampshire
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 1
Injuries:	Crew - Minor - Passengers - None
Nature of Damage:	Severe damage to wing and tail plane structures
Commander's Licence:	Private Pilot's Licence
Commander's Age:	69 years
Commander's Flying Experience:	8,000 hours (of which 300 were on type) Last 90 days - None Last 28 days - None
Information Source:	Aircraft Accident Report Form submitted by the pilot; further enquiries and examination of the wreckage

History of the flight

Prior to the flight the pilot had prepared the aircraft and checked the weather, which was suitable for the local demonstration flight. He had noted the surface windspeed on the airfield anemometer repeater, which showed northerly 12 to 15 kt with moderate swings from the west.

The passenger was dressed appropriately for the open cockpit environment, including a leather flying helmet, goggles and oxygen mask, which contained a microphone for the intercom. He was given a full safety briefing, which included how to undo the four point safety harness and exit the aircraft in the event of an emergency. The pilot entered the aircraft first followed by the passenger who was assisted by a member of the ground crew into the front cockpit. He also checked the security of his harness and gave a short cockpit briefing on the controls and instruments.

The propeller was hand swung by a member of the ground crew and the engine run for the required four minutes warm up period. During that time control and engine power checks were successfully completed against the chocks with the slats selected to the 'locked in' position. The pilot confirmed

over the intercom that the passenger was satisfied with the intended flight and proceeded to taxi from the hangar area initially along the level north western side of the airfield then down the grass slope towards the eastern side of the airfield.

The aircraft was turned around on to a take-off heading of approximately 300°(M), pointing to the left of a large two storey building with flag poles adjacent to it which is located on the north west side of the airfield. Whilst the building was hidden by the rising ground ahead of the aircraft, the flags at the top of the poles were just visible. To the left of the aircraft a windsock was visible which indicated a moderate wind slightly from the left. Whilst the pilot would have preferred a more westerly take-off run, this was not possible without encroaching an area to the left which had been allocated to parascending and was very active.

The pilot commenced his take-off run maintaining into wind aileron and raising the tail with forward movement of the control stick. The aircraft landing gear absorbed the grass undulations and became airborne in a wings level climbing attitude. The pilot described the take-off run as slow but within a normal distance for the upslope take-off direction. The exact Indicted Air Speed (IAS) was not noted but it remained low during the short climb above the rising slope. The pilot was looking along the left side of the aircraft due to the nose obscuring his view ahead. On cresting the slope, the wind was much stronger and more from the left causing the aircraft to drift to the right. Despite altering the heading to the left the aircraft continued to drift to the right and towards the large building immediately ahead. On noticing this the pilot closed the throttle and tried to turn the aircraft to the right to avoid the building and to land on some open ground. The airspeed was now very low and the left wing dropped striking the ground with the lower left wing tip followed immediately by the upper left wing tip. The aircraft collided with a small bush and yawed around to the left coming to rest with the fuselage on its left side with the wings wrapped over it along the left side. There was no fire but a strong smell of fuel. The passenger, who was uninjured, was able to undo his harness and with some difficulty exit the forward cockpit to the rear along the left side of the fuselage. He was able to undo the pilot's harness but was not able to release him.

The airfield Rescue and Fire Fighting Service (RFFS) had seen the aircraft pass their station and, realising that it was in difficulties, activated the crash alarm. They were on the scene almost immediately and released the pilot and applied a foam blanket to the wreckage. The pilot had remained conscious but had struck his head on the leather pad above the instrument panel and suffered a cut to the bridge of his nose caused by his goggles.

Examination of aircraft

The aircraft was examined in a hangar at Middle Wallop on 8 June 2000. The wreckage was lying in a similar disposition to that in which it had come to rest following the accident. The fuselage was lying on its left side between the upper and lower left mainplanes. The lower right wing had broken at mid span and had flipped over the top of the forward fuselage. The upper right wing was lying approximately in line with the upper left wing, and had suffered a main spar failure in the outboard section. No evidence of a pre impact failure was found in the bracing wires or strut attachments.

Tree foliage was found wrapped around the interplane struts on the left side, but there was evidence of more severe impact damage on the right wing tips and the right landing gear.

The fuselage had sustained comparatively little disruption and it was clear that the impact speed had been low. The harnesses were of the 'Z' type and had held in the impact.

Inside the rear cockpit, the throttle was noted to be at the approximate mid point (although it was free to move), the fuel selector was ON and the elevator trim was slightly nose down from the mid position. The leading edge slat locking lever, on the right side of the cockpit, was at the fully forward, ie unlocked end of its quadrant. In this position, the slats would have been free to extend under the action of aerodynamic loads at low airspeeds and/or high angles of attack. When the lever is in the rear, ie locked position, it applies tension to a cable that is attached to both slats, thus preventing them from extending. There is no slat interconnect cable in the Tiger Moth, ie the slats are free to extend independently of one another. The cables were examined and were found to be connected to the slat surfaces at their mid points. However the cable in the left wing was found to be severed in the inboard portion of the wing. This appeared to be associated with a cut that had been made in the main spar during the recovery operation. The primary flying controls had remained connected following the accident.

Conclusions

The pilot concluded that the cause of the accident was that the wind backed and increased as he crested the ridge, which caused the aircraft to drift to the right towards the building. When combined with the reduced angle of climb, he was obliged to abandon the take off, an action which he had left a little too late. The combination of low airspeed and trying to bank the aircraft had caused the left wings to drop at the stall.