

ACCIDENT

Aircraft Type and Registration:	Grob G102 Astir CS77, G-CFSZ	
No & Type of Engines:	Not applicable	
Year of Manufacture:	1979	
Date & Time (UTC):	13 June 2009 at 1619 hrs	
Location:	Ratley, Warwickshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Fatal)	Passengers - N/A
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Gliding Silver Badge	
Commander's Age:	64 years	
Commander's Flying Experience:	479 hours (of which 96 were on type) Last 90 days - 24 hours Last 28 days - 10 hours	
Information Source:	AAIB Field Investigation	

Synopsis

In weak thermal conditions, the glider did not maintain sufficient height to continue on to the intended destination. It departed controlled flight at low altitude, whilst positioning for a field landing, and struck the surface with a high rate of descent. The pilot suffered fatal injuries.

History of the flight

The pilot intended to fly cross country from Aston Down Airfield, Gloucestershire, to Husbands Bosworth Airfield in Leicestershire, approximately 60 nm to the north east, and return without landing. The glider was winch launched at 1334 hrs and flew to Husbands

Bosworth, thermalling¹ several times enroute and operating at an average altitude of approximately 4,000 ft. The outbound leg seems to have been uneventful.

Shortly after turning at Husbands Bosworth, the glider thermalled again before setting course to the southwest. During several subsequent thermalling manoeuvres the glider reached a maximum altitude of 4,248 ft and at 1553 hrs continued in a southerly direction towards Banbury, descending at an average rate of 170 fpm.

Footnote

¹ When thermalling the pilot attempts to fly the aircraft within a thermal, a rising mass of air that has been warmed more than the surrounding atmosphere.

At 1605 hrs, at an altitude of 2,300 ft, the glider began manoeuvring, as though attempting to thermal once more, but descended to an altitude of 1,900 ft. The descent continued as the glider tracked southwest until, at 1613 hrs, at an altitude of 1,500 ft, the pilot attempted a further thermalling manoeuvre. The glider exited this manoeuvre after seven complete turns at an altitude of 1,200 ft, approximately 800 ft above local terrain.

From the exit of the final thermal attempt, the glider flew south towards the village of Ratley and in the general direction of Edgehill gliding site, 3 nm away. As it did so, it flew over rising ground which formed part of a north facing escarpment. Over the eastern edge of Ratley the glider turned right, at a height of between 200 and 300 ft, onto a track of approximately 030°. Several witnesses saw it flying at low level, probably less than 200 ft above local terrain, before making a sharp left turn. During this turn the nose of the glider dropped and its subsequent flight path was obscured from view by trees.

Witnesses went immediately in the direction of the last sighting and found that the glider had crashed on sloping ground at the head of a shallow valley. The pilot was fatally injured. Police and an air ambulance attended shortly afterwards.

Wreckage information

The aircraft struck the ground on approximately the opposite heading to that which it was on when it was last seen in the air. At the instant of impact, it was pitched steeply nose down and banked slightly left, with significant rotational momentum, consistent with an incipient spin to the left.

The aircraft was structurally intact and all flying controls were connected when it struck the surface. However,

it was not possible to establish the positions of any of the flying controls at the moment of impact. The main wheel gear operating lever in the cockpit was gated into the DOWN position, consistent with an intention to land.

Externally, the aircraft appeared to be largely intact, except for an impact fracture of the rear fuselage immediately forward of the base of the fin. Internally, however, the fuselage structure, as far back as the wing trailing edge, together with the wing attachments and associated structure, the cast-aluminium fuselage frames, and most of the flying control system cranks and levers were extensively dislocated and broken apart by the forces generated at impact.

In summary, detailed examination of the wreckage revealed no evidence of any pre-impact defect or malfunction of the aircraft structure or flying controls.

Recorded information

The glider was equipped with a GPS receiver which was coupled to a glider data logger which recorded position and pressure altitude every four seconds. The recording was successfully downloaded at the AAIB.

Meteorological information

Weather conditions along the route were generally good. The wind was from the southwest at 10 to 15 kt and there was scattered cloud with a base at approximately 4,300 ft agl. Visibility was in excess of 10 km and there was no precipitation. Pilot reports indicated that there was an area of spreadout² moving northeast along the route that may have been over the Banbury area at the time of the accident.

Footnote

² A term used by glider pilots to describe conditions in which cumulus cloud formations have coalesced to form a continuous cloud layer. This tends to reduce thermal activity by preventing solar radiation from reaching the ground.

Geography

Ratley is located at an elevation of approximately 680 ft amsl, near the crown of a north facing escarpment. North-east of the village, in the direction of the accident site, the ground is level over a distance of approximately 300 m then descends into a shallow valley aligned north-south. Viewed from the air, from a height of 500 ft, there are several fields that appear free from obstruction but, on closer inspection, only one of these, forming the flat area north-east of the village, has a relatively smooth surface. Landing diagonally across this field in a south-westerly direction (and therefore into wind) would provide a maximum ground run of 280 m. The track of 030° flown by the glider immediately before its final turn corresponded to a left hand downwind leg for this field.

North of the escarpment, the ground descends steeply to a plain within which there are several fields which would have had an into-wind dimension that was greater than 300 m. On exiting the final attempt at a thermal manoeuvre, the pilot would not have seen these fields unless he looked over his right shoulder.

Pilots operating from Edgehill gliding site, who were familiar with local conditions, stated that south-westerly winds flowing over the ridge north of Ratley could result in downdrafts.

Medical and pathological information

The pilot held a valid UK NPPL³ Medical Declaration. Post-mortem examination showed that he died of multiple injuries sustained during the impact. There was no evidence of natural disease which could have caused or contributed to the accident and toxicology revealed no evidence of drugs or alcohol. The accident was

Footnote

³ National Private Pilot's Licence

considered to be non-survivable and it is unlikely that any additional or alternative restraint would have saved the pilot's life.

Aircraft information

The flight manual for the glider states that warning of the stall occurs between 32 and 35 kt depending on wing loading and is characterised by "shuddering" of the tail unit. It states that, during a stall, it is:

'possible to make turns up to an angle of bank of 20° without the wing dropping away.'

The flight manual also states that on entry to a spin the nose of the aircraft will drop in the direction in which rudder is being applied.

Techniques for landing out

The Chief Flying Instructor (CFI) of the gliding club of which the pilot was a member emphasised the importance of selecting several possible landing sites when within 2,000 ft of the ground and that, having decided on a landing field, the turn onto the final approach track should not be made at a height of less than 300 ft. He noted that the workload associated with handling an aircraft, whilst deciding where to land, could increase dramatically as height decreased.

The CFI judged that, from the height at which the glider crossed the ridge north of Ratley, it would not have been possible to land at Edgehill and that it is unlikely the pilot intended to do so. Pilots from Edgehill concurred with this view.

Previous occurrences

Information provided by the British Gliding Association (BGA) indicates that in the UK, since 1987, there have been a total of 637 field landing accidents reported, of

which 342 have resulted in substantial damage to or total destruction of the glider involved. Of these, 33 have resulted in serious injury and four in fatalities.

Between 1974 and 2008 there were 226 occurrences resulting in serious injury of which 54 involved field landings. In the same period there were 124 fatal accidents, 10 of which involved field landings. Approximately half of all such accidents have been attributed to late selection of a landing field.

In its review of gliding accidents in 2008 the BGA reported that there had been 19 field landing accidents, including 3 which involved a stall or spin. The review commented:

'Landing on any surface at minimum speed with the wings level is preferable to a stall and spin.'

It noted that pilots should:

'avoid flying over unlandable terrain unless able to glide clear and select a field in time to fly a full circuit.'

Analysis

Information recovered from the data logger indicated that the pilot was able to navigate the aircraft and maintain height successfully until 1553 hrs, when he was on the homeward leg, 15 nm south of Husbands Bosworth Airfield. Throughout the next 26 minutes, despite two thermalling attempts, the glider lost height and was eventually too low to continue with the intended flight.

The pilot seems to have positioned the aircraft downwind for what may have appeared to be a suitable landing field, being the longest field free of obstacles immediately visible ahead of the aircraft at the conclusion of the final thermal attempt. There were, in fact, larger fields at a lower elevation to the north of the ridge but these may not have been readily apparent to the pilot, who was faced with making a quick decision at a low height. Eyewitness accounts indicate that the glider then made a sharp left turn, which the pilot may have initiated in an attempt to turn onto a final approach track for the selected field. The glider was less than 200 ft above local terrain and possibly too low to complete a controlled turn. During this turn, the glider was seen to manoeuvre in a manner consistent with entry into a stall. Shortly afterwards, it struck the ground with a high rate of descent.

There was no evidence of any mechanical defect on the glider or of the pilot suffering from a medical condition that could have contributed to the accident. However, there were reports of atmospheric conditions that might have resulted in weaker thermal conditions in the area of Banbury. Shortly before the end of the flight, as the glider crossed the ridge north of Ratley, it may have encountered a localised descending air mass, as a result of the south-westerly wind. It is most likely, therefore, that the loss of height was due to a lack of thermal activity exacerbated towards the end of the flight by local downdrafts.