

Accident

Aircraft Type and Registration:	Grob G109B, G-CHYB	
No & Type of Engines:	1 Grob 2500-E1 piston engine	
Year of Manufacture:	1985 (Serial no: 6372)	
Date & Time (UTC):	27 August 2024 at 1545 hrs	
Location:	A419 near Aston Down Airfield, Gloucestershire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Minor)	Passengers - 1 (Serious)
Nature of Damage:	Aircraft damaged beyond economic repair	
Commander's Licence:	Light Aircraft Pilot's License (Aeroplanes)	
Commander's Age:	70 years	
Commander's Flying Experience:	1546 hours (of which 170 were on type) Last 90 days - 20.5 hours Last 28 days - 4.5 hours	
Information Source:	AAIB Field Investigation	

Synopsis

The aircraft was on the late stage of final approach to Aston Down Airfield when it pitched down rapidly. The aircraft struck trees and then came to rest on the A419. Both those on board were injured and taken to hospital by the emergency services. The aircraft was severely damaged and the A419 was closed for several hours. The passenger, an experienced glider pilot, was flying the approach. The passenger's gliding experience meant that they would normally fly the approach with their right hand on the control column and their left hand controlling the rate of descent using the airbrake handle. Flying the Grob 109 from the right seat, this control arrangement was reversed. When attempting to reduce the rate of descent, the passenger inadvertently pushed forward on the control column which caused a rapid increase in the rate of descent which could not be corrected before the aircraft struck the ground.

History of the flight

The pilot, who was also the owner of the aircraft, was intending to sell a share of the aircraft and was flying to demonstrate it to a prospective buyer. The pilot arrived at Aston Down Airfield at 1130 hrs, took the covers off, cleaned and refuelled the aircraft. He refuelled with super unleaded automotive petrol, adding around 20 litres to give a total of 40 litres on board. The aircraft is a Grob 109B Touring Motor Glider (TMG) which is kept rigged at the airfield. The pilot completed the Daily Inspection.

The pilot then started the aircraft and took off with the prospective buyer on board. They flew to Enstone Airfield and back, then did some general handling, flying for around one hour. The buyer and their partner were well known to the pilot, after the first sortie the pilot offered the partner a flight to experience the aircraft. This second passenger is a very experienced glider pilot and instructor, with over 8,000 gliding hours but no experience of powered aircraft. The pilot and passenger had a brief discussion before departing and the passenger stated he told the pilot, "I am not a power pilot."

They departed from the grass runway at Aston Down and flew to the south of the airfield to carry out some general handling. During this the pilot allowed the passenger to take control of the aircraft. The passenger was in the right seat, so for this phase of flight had his right hand on the control column and his left hand on the engine controls. After around 20 minutes the aircraft returned to Aston Down and positioned for an approach. The passenger stated that he had no intention of trying to land the aircraft. However, he continued to fly through the turn onto final approach with his right hand on the control column. The intent was to make an approach in gliding mode, with engine at idle power and the rate of descent (ROD) controlled by the airbrakes. The airbrakes are operated by a lever on the sides of the cockpit, so for the passenger in the right seat the control was to his right. After the final turn he swapped his left hand to the control column and operated the airbrakes with his right hand. The approach was made at an airspeed of 60-70 kt.

The pilot made no effort to take control from the passenger nor did the passenger say to the pilot "you have control". The wind was 220° at 15 gusting 20 kt so there was some turbulence on the final approach. At approximately 100 ft agl the passenger felt the aircraft was too low on approach and believed he took corrective action. However, the aircraft pitched down rapidly and struck trees one and half seconds later. The aircraft then came to rest on the A419 which runs along the north side of Aston Down Airfield.

The pilot was able to get out of the aircraft, but the passenger was extracted by ambulance paramedics. Both the pilot and passenger were taken to hospital by the emergency services. The pilot had sustained only minor injuries and left hospital later that evening. The passenger suffered a spinal injury and required surgical intervention, spending several days in hospital.

Accident site

The accident occurred during a final approach to the grass runway parallel to and west of tarmac Runway 21 at Aston Down (Figure 1).

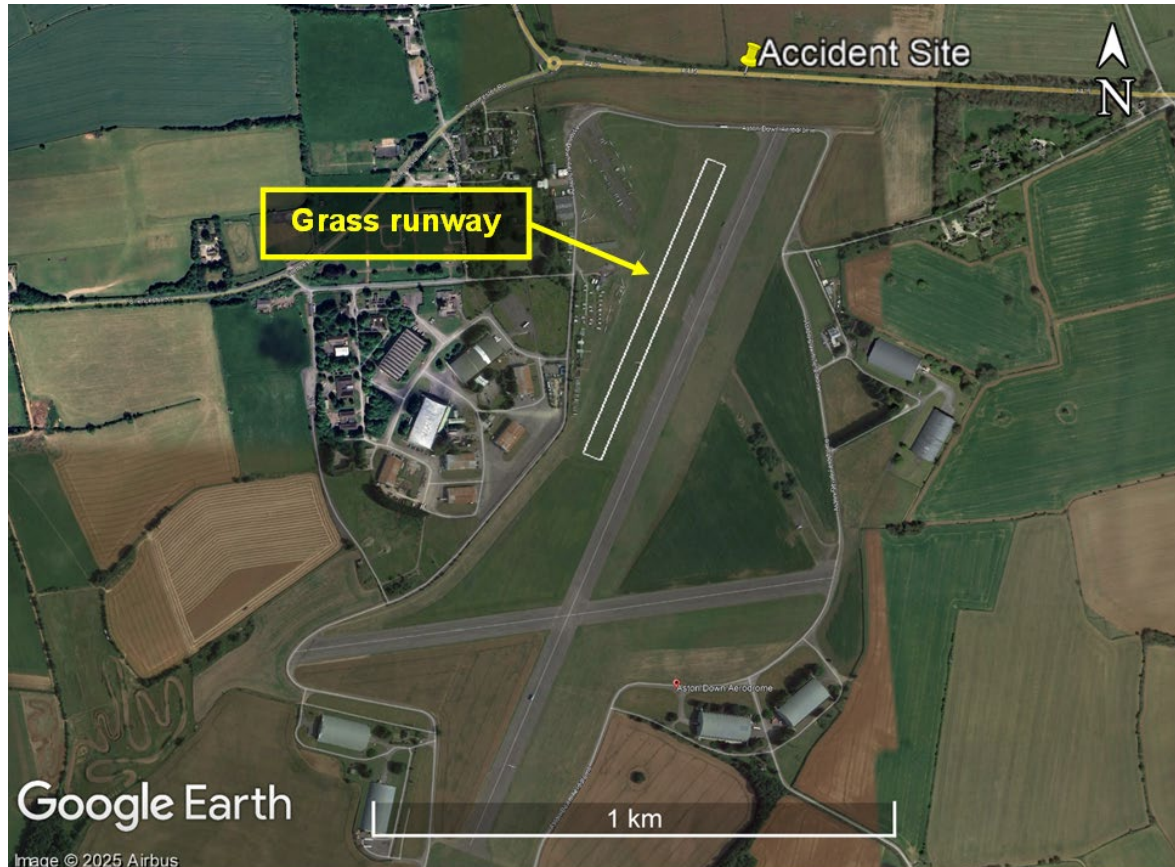


Figure 1

Aston Down Airfield

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After striking the trees, the aircraft came to rest on the carriageway of the A419, blocking the road for several hours.

Recorded information

A PowerFLARM unit and PilotAware Rosetta were recovered from G-CHYB. Data from the accident flight was downloaded from the PowerFLARM's onboard memory.

Although no data was recorded on the Rosetta unit, multilaterated ADS-B data was recorded by a ground server, which captured most of the flight up until the base turn. This data was consistent with the FLARM recordings. Radio exchanges at Aston Down were not recorded, nor were they required to be.

FLARM logs

The PowerFLARM logged GPS position and pressure altitude once per second. The last recorded position was about 275 m short from where G-CHYB came to rest. FLARM logs from a glider tracking website also contained the GPS data, and, although at a lower sample rate, included two additional data points time-stamped after the PowerFLARM recording ended. It was not determined why the PowerFLARM recording stopped prematurely.

Figure 2 shows the groundspeed and altitude data from these data sources. The recorded groundspeed shortly before the accident corresponds to a calculated airspeed of about 60 kt based on the forecast wind conditions (see [Meteorology](#) section).

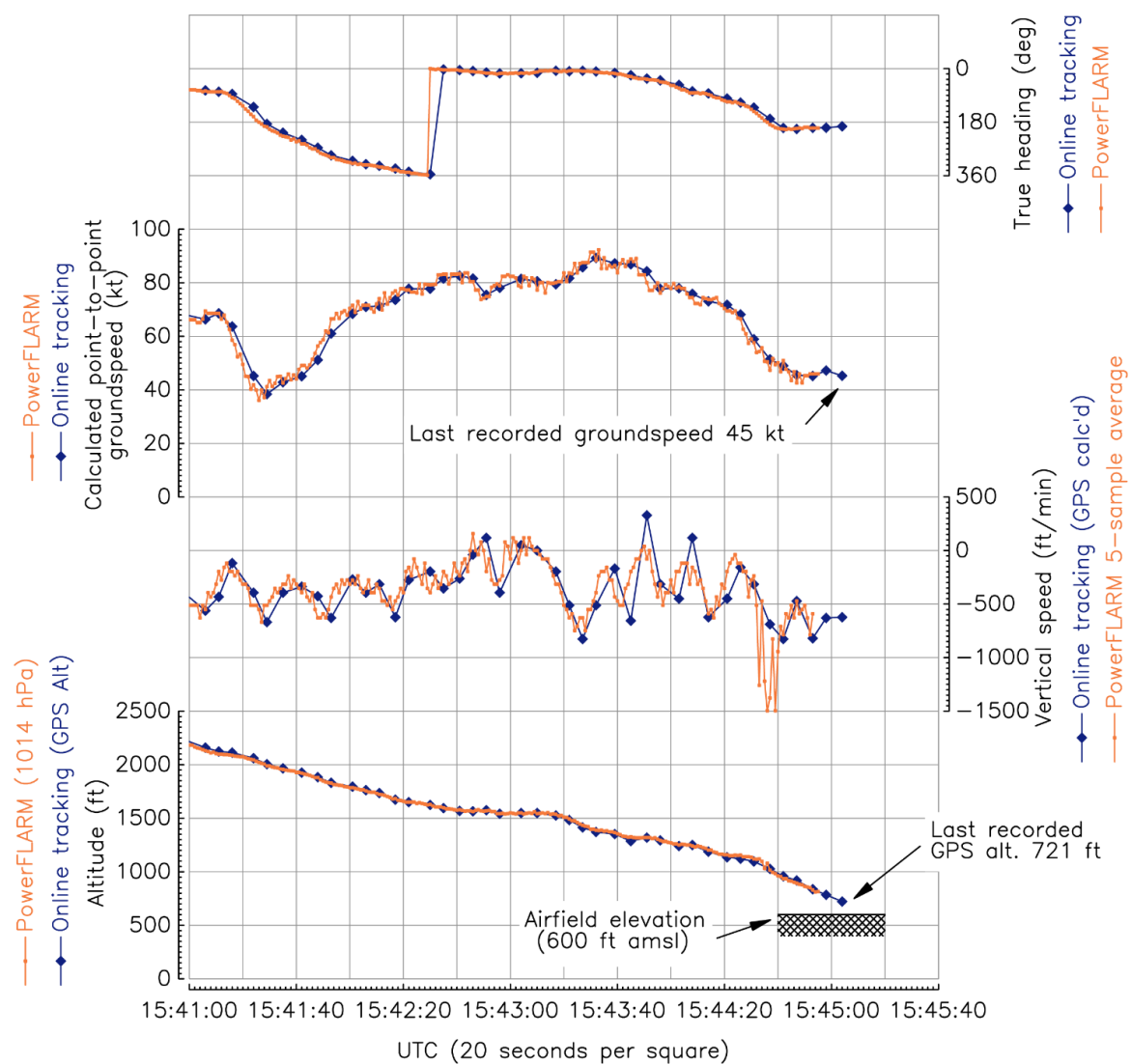


Figure 2

Pertinent parameters recorded during G-CHYB's base turn and approach

CCTV

A security camera captured the final seconds of the flight. G-CHYB became visible in the video just before it was seen to pitch down steeply. Figure 3 illustrates a composite image of frames taken at 0.25 second intervals from when G-CHYB became visible in the video.

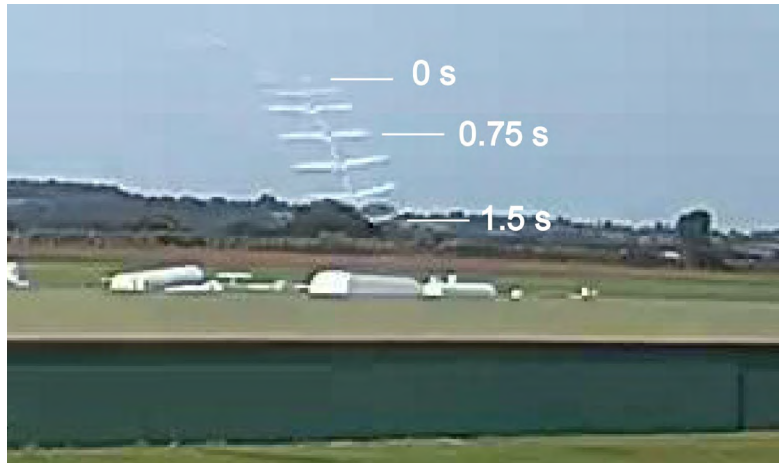


Figure 3

Composite image showing G-CHYB as it descended towards a tree beside the A419

Aircraft information

The Grob 109B is a 2-seat side-by-side low wing touring motor glider (Figure 4).



Figure 4

Grob 109B

The aircraft has side-by-side seating and dual controls. Each seat has a control column located centrally in front of the pilot. Engine and propeller controls are on the centre console of the cockpit. The airbrake controls are outboard of each seat (Figure 5). When in powered flight the operating pilot uses the control column and the engine/propeller controls. The engine is normally left to run at idle when in gliding mode, while the pilot uses the control column and airbrake to control the aircraft. As a result of this arrangement pilots are required to change hands on the flying controls when changing from powered to gliding flight. A modification is available for the aircraft to add an additional throttle control to the left side of the instrument panel which allows the left seat occupant to operate the airbrakes and engine controls without changing hands (Figure 5). However, this modification was not fitted to the accident aircraft and it does not change the control configuration for the right seat occupant.



Figure 5
Cockpit control positions

In most unpowered gliders the controls are arranged so that the pilot's use their right hand on the control column and operate the airbrake with their left hand. Unpowered two seat gliders typically have an in-line cockpit arrangement, rather than side-by-side, so the control layout is the same regardless of which seat the handling pilot is operating from. However, the side-by-side arrangement in G-CHYB meant that the pilot in the left seat would have the normal arrangement of gliding controls, while the pilot or passenger in the right seat would have the controls in opposite hands.

The airbrake system has an over-centre lock to stow the airbrake surfaces, which requires a notable physical input to overcome. When partially deployed, the aerodynamics of the aircraft tend to draw the airbrakes further out and so a relatively high input force is required to retract them. The airbrake control is therefore heavier to operate. In comparison the forces required on the control column are low. In operation, aft movement of the airbrake lever extends the airbrake surface on the wing and so increases the ROD.

Aircraft examination

The aircraft came to rest on a busy main road, resulting in significant disruption to traffic. To alleviate this as quickly as possible, permission was given for the aircraft to be recovered prior to the arrival of the AAIB. The wings and horizontal stabiliser of the glider were removed in order to transport it back to the gliding club's hangar. As such, control continuity could not be independently checked, but witnesses who conducted the disassembly, stated that the flying control connections were all normal and fully engaged.

The fuselage tail section and right wing were severely damaged in the ground impact sequence, along with the landing gear and cockpit canopy. This damage was consistent with contact with trees and the stone wall at a high rate of descent at impact.

Meteorology

Aston Down has no facility to record meteorological data, so the Met Office were asked to review the conditions for the area. A ballooning forecast had been prepared for the south-west region. The extract from the ballooning forecast stated:

'The forecast details for Malmesbury, approximately 12 miles south of the area of interest, was extracted from the afternoon Ballooning Forecast for the South West region. This is showing forecast surface winds to be around 13 knots at the time of the incident, with 21 knots at 500 FT and 23 knots at 1000 FT.'

Malmesbury is at a similar elevation to Aston Down reported:

'The afternoon of the 27th August 2024 saw generally settled conditions with good visibility and few amounts of cloud above 4000 FT across the area of interest. To the west of the area surface winds were generally light however they were slightly stronger in the east as shown by the observations from RAF Fairford. In addition to this the forecast conditions for a site close to the incident site is showing stronger winds above the surface. Due to the height of Aston Down, it is reasonable that the surface winds, would be similar to the forecast winds at Malmesbury, which is at a similar height.'

The wind direction was from the south-west. Weather is not considered to have been a factor in the accident.

Personnel

Only the pilot of G-CHYB had a licence for powered aircraft, but both of those aboard were experienced glider pilots and gliding instructors. They had not previously flown with each other. The passenger had a significant profile within the gliding world and was well known to the pilot. The passenger had around 8,000 hours of glider experience.

There was no briefing about the handling of the aircraft prior to departure as the pilot stated he “was not acting as an instructor”. Once airborne the pilot offered the passenger control and stated that the passenger “wanted to fly”. The pilot described the passenger as handling the aircraft well. Away from the airfield the passenger flew the aircraft with his right hand on the control column and his left on the engine/propeller controls.

The intent was to make the final approach to land with the aircraft being operated in glider mode. In glider mode the pilot controls airspeed with pitch and ROD using the airbrakes. As the right seat airbrakes are mounted on the cockpit wall, a pilot in that seat operating in glider mode would have their left hand on the control column and their right hand on the airbrake. Most gliders are operated with the airbrake in the pilot’s left hand and the control column in the right hand.

The passenger stated that he has flown 140 types of gliders, and that all had the “conventional” configuration of controls saved for the right seat of the Grob 109 and the Slingsby T21. The passenger owns a share in a Slingsby T21 which he stated he routinely flew from the left seat. The T21 has differing airbrake controls but the passenger did have some experience of flying with his left hand on the control column.

Left and right seat operations

The Pilots Operating Handbook for the Grob 109 states that for solo flights the aircraft must be operated from the left seat. In this event with two on board, the pilot in command was in the left seat. The passenger who was handling the aircraft had no experience of operating the Grob 109 from the right seat. Although he was an experienced glider pilot, he was more familiar operating aircraft with the air brakes in his left hand.

There is no established training requirement either in the British Gliding Association (BGA) guidance or CAA regulations for training pilots before operating from the right seat.

Analysis

The aircraft was being flown by the passenger in the right seat. Away from the airfield the passenger flew the aircraft with his right hand on the control column and had the engine controls in his left hand. Having the control column in his left hand was the configuration most familiar to the passenger and he did not have any difficulty operating the aircraft. The intent was to make the approach operating the aircraft in gliding mode so as the aircraft neared final approach, the passenger swapped hands so that his left hand was on the

control column and his right hand was on the airbrakes. The passenger was controlling ROD with airbrake and airspeed with pitch, which is usual for an approach in a glide. He has significant experience of flying gliders, so the control principle was familiar to him. However, the passenger had limited experience of operating with the control column in his left hand and no previous experience of operating a Grob 109 from the right seat. His established practice would therefore have been to make control adjustments to pitch with his right hand and adjustments to ROD with his left hand. If the aircraft was low on approach the required adjustment from a pilot would be to reduce ROD by retracting airbrake and then to compensate for airspeed by slightly raising the pitch attitude. This would require a firm push on the airbrake control and a small input on the control column.

In this event, as the aircraft reached approximately 100 ft agl the pilot felt he was somewhat low on approach and intended to make control inputs to reduce the ROD. It is likely that the strong habits formed by his experience caused him to make the intended inputs on the incorrect controls, so he pushed firmly with his left hand expecting that to retract the airbrake while pulling back with his right hand to raise the pitch attitude. The outcome was that the aircraft pitched down rapidly, and more airbrake deployment increased the ROD. Both those on board were surprised by the rapid pitch down and did not immediately recognise the cause. It is probable that both suffered a startle response and were unable to take appropriate corrective action in the timeframe available. The aircraft struck the trees alongside the A419 approximately 1.5 seconds after the pitch down began.

The passenger believed that the pilot should not have allowed him to fly the approach. The pilot has stated that he did intend to take control for the landing but that the passenger initiated the pitch down before he did so. It would have been appropriate for the pilot to fly the approach but given the public profile and acknowledged experience of the passenger within the gliding community, the pilot believed the approach was within the expertise of the passenger. Had he felt uncomfortable with the handling of the aircraft the passenger had the opportunity to relinquish control, but he did not do so.

No evidence was identified of a contributory technical problem with the aircraft.

Conclusion

Inappropriate control inputs as a result of the passenger's lack of experience operating the Grob 109 from the right seat caused a rapid pitch down from approximately 100 ft agl. Neither of those aboard was able to take corrective action in the short time available and the aircraft struck trees adjacent to the A419 road before coming to rest on the carriageway. The pilot suffered only minor injuries, but the passenger was seriously injured. The aircraft was damaged beyond economic repair.

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