

ACCIDENT

Aircraft Type and Registration:	Rolladen-Schneider LS8-18, G-CJNB
No & Type of Engines:	No engines
Year of Manufacture:	1998 (Serial no: 8227)
Date & Time (UTC):	5 September 2021 at 1240 hrs
Location:	Seighford Airfield, Staffordshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Serious) Passengers - N/A
Nature of Damage:	Extensive damage to the fuselage and wings
Commander's Licence:	UK Sailplane Pilot's Licence
Commander's Age:	62 years
Commander's Flying Experience:	113 hours (of which 20 were on type) Last 90 days - 19 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional information provided by others

Synopsis

The pilot was flying a circuit following a winch launch. As the glider approached the landing site the pilot thought the glider was too high to make a safe landing so decided to fly an orbit. However, there was insufficient height to complete the orbit and the glider collided with trees in an adjacent field.

After the accident the pilot reflected that her previous experience at a hillside landing site and on lower performance gliders may have caused her to misjudge the approach. This report considers how previous experience can influence perception and discusses the challenge of decision making in a time-limited and stressful situation.

History of the flight

The pilot was a member of the gliding club at Seighford Airfield in Staffordshire. On the day of the accident, she arrived at the club in the morning, attended the morning briefing and rigged G-CJNB. The weather was not particularly suitable for soaring so she planned to practice some winch launched circuits at the airfield. She was relatively new to flying G-CJNB and felt she would benefit from more practice flying circuits. Her last few flights had been aerotow launches and it was over 30 days since her last winch launch, so she undertook a winch launch check flight with an instructor in a Grob Twin Astir glider (G-CKRH). The check flight went well with the instructor commenting that the "circuit planning and approach and the landing were executed well".

Several hours after the check flight the pilot prepared for a solo flight in G-CJNB. The winch launch commenced at approximately 1237 hrs and witnesses commented that the takeoff and climb into the circuit appeared normal. Several witnesses watched the glider turning onto final and make its approach and all agreed that it appeared to be higher than they would normally expect. As it drew level with the launch point witnesses estimated it was about 150 – 200 ft above the ground, where they would normally expect a glider to be at about 50 ft. At this point the airbrakes were heard to retract and the glider started a turn to the left. Witnesses watched it continue in a descending left turn. As the glider turned back toward the airfield it disappeared behind the treeline. Several witnesses heard the glider collide with the trees and impact the ground. Some witnesses briefly saw the tail and wingtip above the treeline as it appeared to cartwheel across the adjacent field.

The glider was found inverted in a field approximately 100 m to the north-west of the launch point. The pilot was extracted from the glider and airlifted to hospital. She had suffered serious injuries to her lower legs and many broken bones but, after a long stay in hospital, returned home to continue her recovery.

Pilot's recollection

The pilot was interviewed several weeks after the accident when she had been released from hospital. She could remember the accident flight until starting to turn left into the orbit but had no recollection after this point.

She recalled that there had been a light north-easterly wind on the day, which she believed was sufficiently "east" to need a little extra speed above the minimum approach speed. She planned to fly a 55 kt approach (the minimum approach speed is 49 kt). She recalled that the "winch launch was all fine but there was no lift at the top". She remembered setting up a very similar circuit to the one she had flown in the Twin Astir earlier.

She thought that she had extended the diagonal leg as she was starting to feel the glider was high, which gave her a short base leg. As she turned onto the final approach, there were trees underneath on the approach which she thought may have affected her perspective. She thought she used full airbrake almost immediately and with 55 kt remembered thinking that it appeared that the glider would "massively overshoot". She remembered thinking "I can't get down before the far bushes". She reduced speed to 49 kt but still appeared to be overshooting; she recalled thinking "you're going to have to make a decision as you're going to go over the far road". She remembered retracting the airbrakes and turning left.

Meteorology

The day of the accident was a clear sky day with a temperature of approximately 21°C. The gliding club have a weather station which records surface wind speed and direction. It recorded that at 1230 hrs the average wind direction was from 103° with an average wind speed of 10.7 kt and a maximum of 11.9 kt. By 1250 hrs the wind was from 110°, with an average speed of 6 kt and maximum of 7 kt.

Airfield information

Seighford airfield has a grass landing area orientated approximately 070°/250° and is approximately 850 m long. There are trees in the undershoot and overshoot in both directions.

Recorded information

The glider was fitted with a Naviter Oudie flight logger and a “FLARM” collision avoidance system, both of which contained recordings of the accident flight. Figure 1 shows the profile flown with relevant heights added. The graph in Figure 2 shows the altitude, ground speed and heading during the approach.

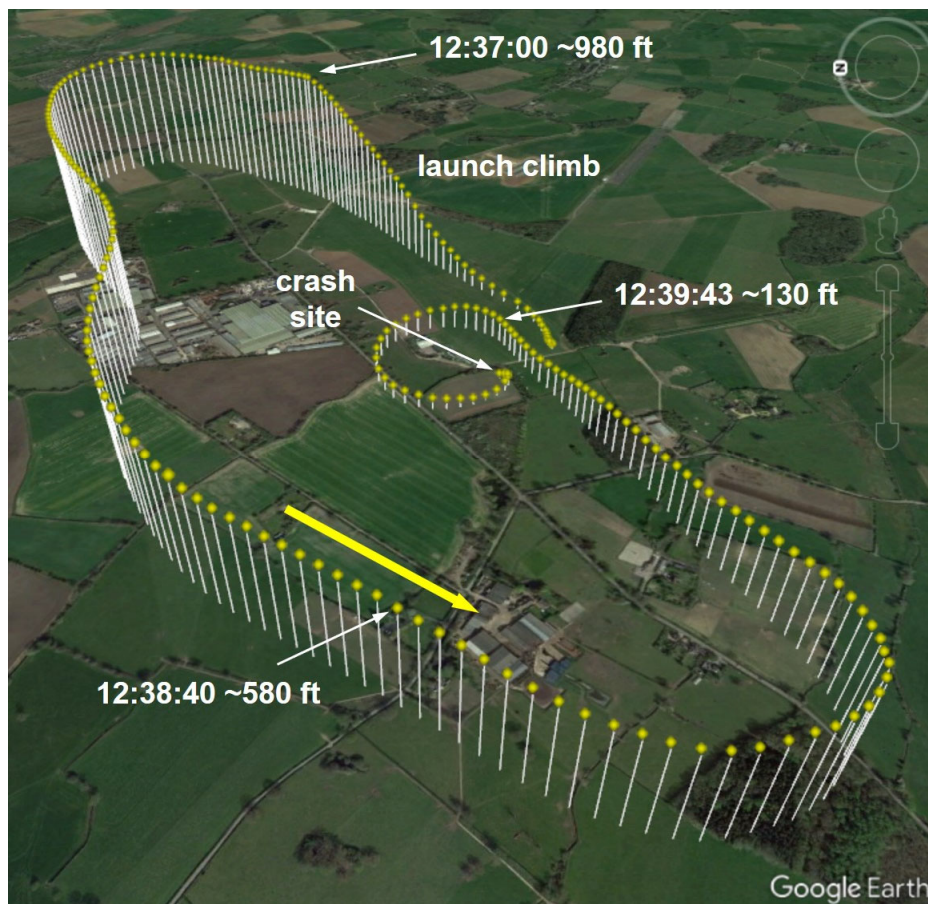


Figure 1

Accident flight profile showing the circuit, approach and orbit (heights are aal)

The flight logs show a normal winch launch and circuit up to the approach back to the airfield. The approach was flown at an average ground speed of approximately 55 kt¹. After crossing the airfield boundary hedge, at a height of 130 ft above the ground, the glider

Footnote

¹ Ground speed was calculated from the recorded GPS position data. There was a headwind on the approach so the airspeed seen by the pilot would have been slightly greater than the ground speed.

started a left turn. Just prior to commencing a left turn the ground speed reduced to 40 kt. The turn continued with a diameter of approximately 350 m. The ground speed increased during the turn to approximately 60 kt.

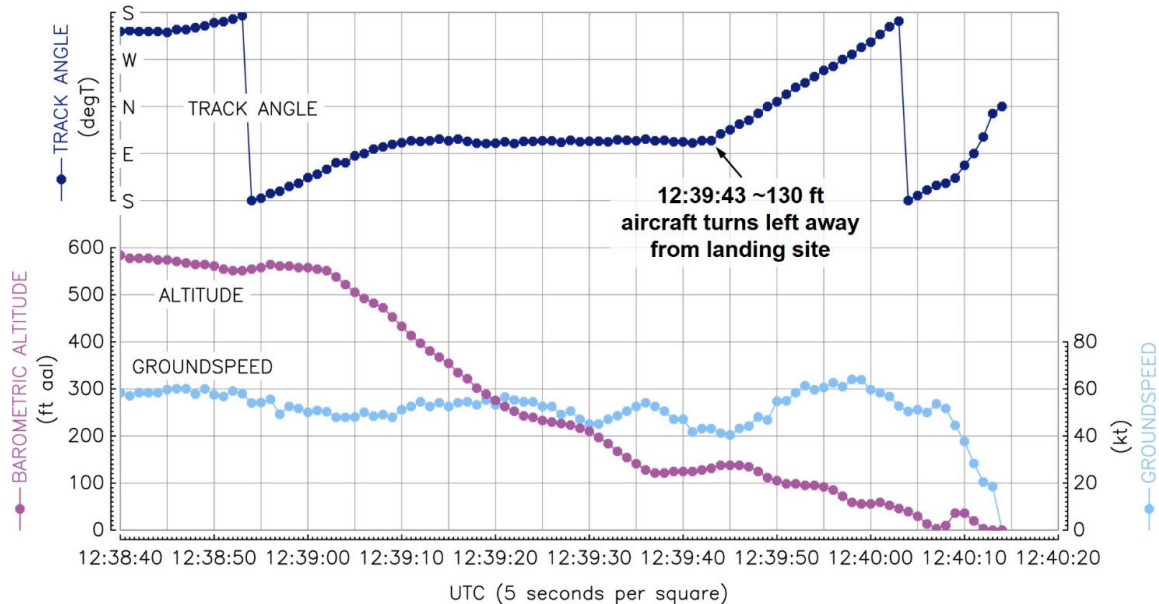


Figure 2

Chart showing the glider's altitude, ground speed and heading during the approach

Accident site and glider examination

Figure 3 shows the glider after the accident; the airfield is just beyond the trees in the background.

The accident site and glider were examined by several experienced members of the gliding club. They reported that the fuselage was very badly damaged forward of the wing and was also broken behind the wing. The right wing had a small diameter impact mark which penetrated the leading edge at about two-thirds span, and there were two large creases in the trailing edge inboard of the impact damage. It was thought this damage was caused by an impact with a tree branch. There was impact damage on the left wingtip but the wing itself was less damaged than the right one. On the underside of the left tip, there were marks showing it had dragged across the ground. The left wingtip extension was detached and closer inspection showed that it had torn the fitting from the main wing. The tail, fin and rudder were essentially undamaged.

There was a one to two-inch-deep ground mark just behind the eventual resting place of the glider. The shape of this and the surrounding debris, including multiple canopy fragments, suggested that this is where the nose struck in a very steep attitude and with little forward speed.



Figure 3

G-CJNB after the accident

All the damage appeared to be consistent with the glider colliding with trees and rotating across the field to its eventual resting point. There was no evidence of any pre-existing damage which could have contributed to the accident.

Glider circuit planning and managing the approach

The circuit flown by gliders needs to be more flexible than that used by powered aircraft to allow for the wind conditions, rising and sinking air, and the glider's performance. Glider pilots typically fly a 'diagonal' leg. When the glider is abeam the landing point the glider is turned onto a heading which 'cuts the corner' of the traditional circuit. This is followed by a short base leg then a turn onto finals. This technique ensures the landing point is continuously in sight and the pilot can judge the glide angle. If the glider is too high the diagonal leg can be widened, and the glider can track further downwind. If the glider is low, the pilot can turn into the landing site earlier. Most modern gliders are also fitted with airbrakes which can be extended to increase the rate of descent. Approaches are normally planned to use half airbrakes so that the amount of airbrake can be increased or decreased to make adjustments to the approach angle. An approach in a glider requires the continual assessment of the glide angle to ensure the glider is flying to the intended landing point. The pilot needs to make timely decisions to adjust the track flown and/or adjust the amount of airbrake to manage the glide angle.

Pilot's background and reflections

The pilot initially learnt to fly gliders at a hillside landing site in the late 1980s, but then stopped flying for several years due to family commitments. She returned to flying in 2019. In 2020 she started to fly from Seighford and began flying G-CJNB. She had accumulated a total of 113 hours and had achieved a BGA Silver Badge².

Reflecting on what happened, she thought that the circuit she flew, which was similar to the circuit she had flown earlier in the Twin Astir, was inappropriate for G-CJNB due to its higher performance. Once she realised she was high on the approach she thought it might have been better to retract the airbrakes and flying over the road, landing in the field beyond the airfield. She also thought that if she had waited very slightly longer after reducing speed on the approach the glider might have started descending satisfactorily.

After the accident, thinking about her previous flying, she realised that her previous flights in G-CJNB were all longer and had given her time to adjust to the higher performance and assess the conditions. She recalled that this flight was her first winch launch straight into a circuit in G-CJNB. She commented that she was never completely happy about the approaches and landings in G-CJNB and thought this was because she was not used to going wide enough and far enough downwind. Her previous flying had been predominantly at a hillside landing site where it was common to fly circuits close to the boundaries of the airfield due to downdrafts. She was aware that she was more familiar with flying tight circuits and was aware that she needed to practice wider circuits in G-CJNB.

Analysis

During the approach to land the pilot perceived that the glider was too high to make a safe landing on the airfield, so decided to fly an orbit to the left. There was insufficient height to complete the orbit and the aircraft collided with trees in an adjacent field.

After the accident the pilot provided helpful reflections on why she believed the accident occurred. She commented that her previous experience at a different gliding site and on lower performance gliders may have skewed her perception of the approach leading her to position the glider too high. Once in this position, she felt her only option was to fly an orbit. After the accident, without the pressure to make a quick decision, she considered that she could have continued ahead to land beyond the airfield or could have allowed more time for the reduced speed to translate into a steeper glide angle and use the airbrakes to land within the airfield boundary.

Human perception and specifically the challenge of judging a glide angle is discussed in CAP 737³. Past experience is a strong influencer in determining what 'looks right' to a pilot. Even when a pilot knows that their past experience may not be correct for the situation it can be difficult not to revert to what looks and feels right.

Footnote

² To be awarded a Silver Badge a pilot must have completed: A duration flight of not less than 5 hours from release to landing, a distance flight of not less than 50 km made as either a flight of at least 50 km in a straight line or a flight round a course flight where one leg is of 50 km or more, and a height gain of at least 1,000 m.

³ CAP 737 is the CAA publication titled '*Flightcrew Human Factors Handbook*' - available from www.caa.co.uk

Once the pilot found herself high on the approach, she was faced with deciding what to do in a stressful and time limited situation. In quick decision making situations humans tend to accept the first solution which appears to offer an acceptable outcome. This is known as recognition primed decision making and is described in detail in CAP737. With limited time humans tend not to be good at evaluating all the available options and making a rational decision on the best option. In this accident the pilot decided to fly an orbit. Without the pressure to make a quick decision she may have considered that continuing ahead was a better option. Pilots may mitigate these situations by trying to think through different scenarios on the ground so that, if they find themselves in that position, they have already considered what they would do.

Conclusion

It is likely that the pilot's previous experience at another airfield and flying lower performance gliders led her to position the glider too high. Once in this position she decided to fly an orbit to lose the height but there was insufficient height to complete the orbit. The accident demonstrates the challenge of judging glide angle and how previous experience can skew a pilot's perception. It also shows the difficulty of making decisions in a time limited and stressful situation.