

AIRCRAFT ACCIDENT REPORT
OCCURRENCE NUMBER 07/4533
ALEXANDER SCHLEICHER FLUGZEUGBAU ASG-29
D-2929
TURRET PEAKS, NEAR MAKARORA
21 DECEMBER 2007



Glossary of abbreviations used in this report:

3D	3-Dimensional
amsl	above mean sea level
CAA	Civil Aviation Authority
E	east
FDR	Flight Data Recorder
ft	foot or feet
FAI	Fédération Aéronautique Internationale
GP	Grand Prix
GPS	Global Positioning System
hPa	hectopascals
IAS	Indicated Airspeed
IGC	International Gliding Commission
kg	kilogram(s)
km	kilometre(s)
kph	kilometres per hour
m	metre(s)
mm	millimetre(s)
NZDT	New Zealand Daylight Time
PDA	Personal Digital Assistant
S	south
°T	degrees true
UTC	Coordinated Universal Time
VHF	very high frequency
WGS 84	World Geodetic System 1984

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Aircraft type, serial number and registration:	Alexander Schleicher Flugzeugbau, 29001, D-2929
Number and type of engines:	Not applicable
Year of manufacture:	2005
Date and time:	21 December 2007, 15:41 hours ¹
Location:	Turret Peaks, near Makarora Latitude ² : S 44° 17' 05.6" Longitude: E 169° 05' 03.3"
Type of flight:	Private, International Gliding Competition
Persons on board:	Crew: 1
Injuries:	Crew: 1 fatal
Nature of damage:	Aircraft destroyed
Pilot-in-command's licence:	Private Pilot Licence (Aeroplane) (Germany)
Pilot-in-command's age:	59 years
Pilot-in-command's total flying experience:	8,706 hours
Information sources:	Civil Aviation Authority field investigation
Investigator in Charge:	Mr P Stevenson-Wright

¹ Times are NZDT (UTC + 13 hours)

² WGS 84 co-ordinates

Synopsis

The Civil Aviation Authority was notified of the accident at 1930 hours on Friday, 21 December 2007. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A CAA site investigation was commenced the next day.

The pilot was competing in day three of a Grand Prix style glider race based out of Omarama. His glider was sharing the lead with two other gliders during the first half of the race. A local state of uncertainty was declared when tracking signals were lost from the glider. An initial search was conducted using an Omarama two-seat training glider and via radio calls. D-2929 was not seen or contactable. Competition pilots returning to Omarama confirmed that his glider was last seen in the vicinity of the Siberia turning point. The RCC were notified of a missing aircraft and a search aircraft was dispatched to the last electronically known position of the glider where it was found to have collided with a small mountain ridge. The first rescuers on the scene found the pilot deceased.

1. Factual information

1.1 History of the flight

- 1.1.1 The pilot, a citizen of Germany, was in New Zealand to compete in the final round of the FAI World GP Gliding Championship based at Omarama, in Central Otago, New Zealand.
- 1.1.2 The Grand Prix was held 19 - 24 December 2007 and consisted of five races between 150 km and 282 km long³ with race times averaging approximately two hours.
- 1.1.3 Each glider was equipped with two flight logging devices which record flight path, altitude, ground speed and several other parameters. In addition each glider had special transmitting devices to allow real time data to be relayed to a mobile production facility. This data was then animated and presented to a worldwide audience via the internet and several international television sports events providers.
- 1.1.4 The course on day three of the championship was 271.7 km long and covered Omarama airfield, Lindis Pass, Lake Hawea, Siberia Valley, Lake Pukaki and back to Omarama.
- 1.1.5 The race started overhead Omarama airfield at 1445 NZDT. Eighteen gliders proceeded initially together in a southwest direction towards the first turning point called, “Goodger” which is approximately 236°T and 45 km from Omarama airfield.
- 1.1.6 From “Goodger” the route required the gliders to track 324°T and 63 km to the next turning point called “Siberia”. During this leg the pilot was joined by two other top international competitors and all three flew similar flight paths.

³ Distances and speeds are given in km and kph which is the standard unit used in gliding competitions.

- 1.1.7 The accident occurred approximately seven kilometres short of the Siberia turning point.
- 1.1.8 The glider struck a small sloping spur ridgeline that lay approximately parallel to the intended flight path.
- 1.1.9 The accident occurred in daylight, at 15:42 hours NZDT, 14 km 245°T from Makarora at an elevation of 5,370 feet on the northern face of the Turret Range. Grid reference NZMS 260-F38-976507, latitude S 44° 17' 05.6", longitude E 169° 05' 03.3".

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	0	0
Serious	0	0	0
Minor/None	0	0	

1.3 Damage to aircraft

- 1.3.1 The aircraft was destroyed.

1.4 Other damage

- 1.4.1 Nil.

1.5 Personnel information

- 1.5.1 The pilot received his German Glider Private Pilot Licence on 10 November 1972. This licence was valid as long as he had a current medical certificate. His most recent German Class 2 Medical Certificate was issued on 4 May 2007 and was valid from 23 May 2007 until 22 May 2008.
- 1.5.2 The pilot gained his German Glider Instructor Rating in 1979 and added a motor glider instructor rating in 1980.
- 1.5.3 He had participated in the World Gliding Championships in 1997 and 2003 and achieved second place in the 2003 European Championship. He had also competed in several German National Championships and won that title in 1990 and 2002.
- 1.5.4 He competed in the New Zealand National Competition in January 2007 at Omarama and had flown 38.15 hours in that region over 14 days.
- 1.5.5 He had also previously flown out of Omarama in December 2005 and logged 36.55 hours including five flights of over five hours duration each.

- 1.5.6 The pilot's total experience was 8,706 hours and he had logged 37.3 hours in the previous 90 days of which 31.7 hours was in glider D-2929.

1.6 Aircraft information

- 1.6.1 The aircraft was an Alexander Schleicher GmbH & Co ASG 29 glider serial number 29001. The first flight of D-2929 was recorded on 9 November 2005 and it was the first prototype of an ASG 29. It flew under the approval of a "Permit to Fly" issued by the Federal Office of Civil Aviation (Germany) which was valid from the 16 July 2007 to 15 July 2008.
- 1.6.2 The aircraft was a high performance single seat shoulder wing glider constructed using advanced carbon, aramid (Kevlar) and polyethylene fibre technology. It had a fixed horizontal T-tail (stabilizer and elevator) and retractable landing gear. The wings were equipped with plain trailing edge flaps and ailerons. Lift spoilers were incorporated on the upper wing surfaces and winglets were mounted on each wingtip.
- 1.6.3 Except for a minor landing mishap a few days prior to the accident, the glider had not incurred any major damage since new. Damage from the landing mishap amounted to minor scrape marks confined to the under fuselage area and these were dressed and polished by an authorised person prior to the accident.
- 1.6.4 The glider had flown 544.21 hours and completed 505 landings prior to it being shipped to New Zealand.
- 1.6.5 The glider was first flown in New Zealand on 8 December 2007. Daily maintenance inspections were completed and signed out by the pilot. Since arriving at Omarama the glider had accumulated a total flight time of 31 hours, 21 minutes.
- 1.6.6 Based on the daily inspection records, there were no known defects with the glider.

1.7 Meteorological information

- 1.7.1 A high pressure system dominated the South Island on 21 December 2007 bringing light winds and sea breezes to most areas. The average forecast wind velocity at 5000 ft amsl was from the northwest at 5 to 10 knots.
- 1.7.2 There was no surface or upper level turbulence forecast in the area.
- 1.7.3 The two glider pilots who were flying near D-2929 stated that they had experienced turbulence at times with moderate turbulence in places. The pilot who was flying abeam the Turret Range ridge line described the turbulence as "rough air with some strong up and down currents spilling over the ridge lines". The pilot who was flying slightly lower than D-2929 described experiencing "bubbles of turbulence".

- 1.7.4 There was little cloud in the area and what did develop was very likely the result of some afternoon heating of the land in relatively clear conditions. There was no precipitation observed on the radar imagery or reported at any of the aerodromes in the region.

1.8 Aids to navigation

- 1.8.1 The glider was fitted with two independent navigation systems, one manufactured by Cambridge and the other by Zander. The pilot also used a PDA with a “moving map” display.
- 1.8.2 Both onboard navigation systems calculated similar information that was useful to the pilot in both navigation and glider performance.
- 1.8.3 In addition to the two navigation systems, the pilot’s own PDA was connected to the Cambridge system. It received GPS and altitude data and displayed that data on the moving map display.
- 1.8.4 The glider’s ground crewman advised that the pilot would have been using the PDA as his primary means of navigation in flight while the other two systems were used as a backup in case the PDA failed.

1.9 Communications

- 1.9.1 The glider was fitted with a VHF transceiver that allowed communications on all standard aviation radio channels.
- 1.9.2 The communications procedures as described by race officials in the race briefing were to monitor a common radio frequency.

“Frequency to be used:

• 133.55MHz is designated as the in-flight safety frequency. Pilots are to remain on this frequency while on track. This frequency will also be monitored by the data-link and camera aircraft (fixed wing and helicopter) and will be available for pilots to ask the chase aircraft to move away if required”.

1.10 Aerodrome information

- 1.10.1 Not applicable

1.11 Flight recorders

- 1.11.1 The two onboard navigation systems also recorded flight data which was downloaded at the end of each flight for validation and scoring using proprietary scoring software designed to score IGC sanctioned competitions. It was a competition requirement that all gliders carry two IGC approved recorders during race events.
- 1.11.2 Both recording devices were recovered from the glider. The “Zander” unit provided detailed information of the entire race. At the time of the accident it was recording data points every four seconds. (see Figure 1).

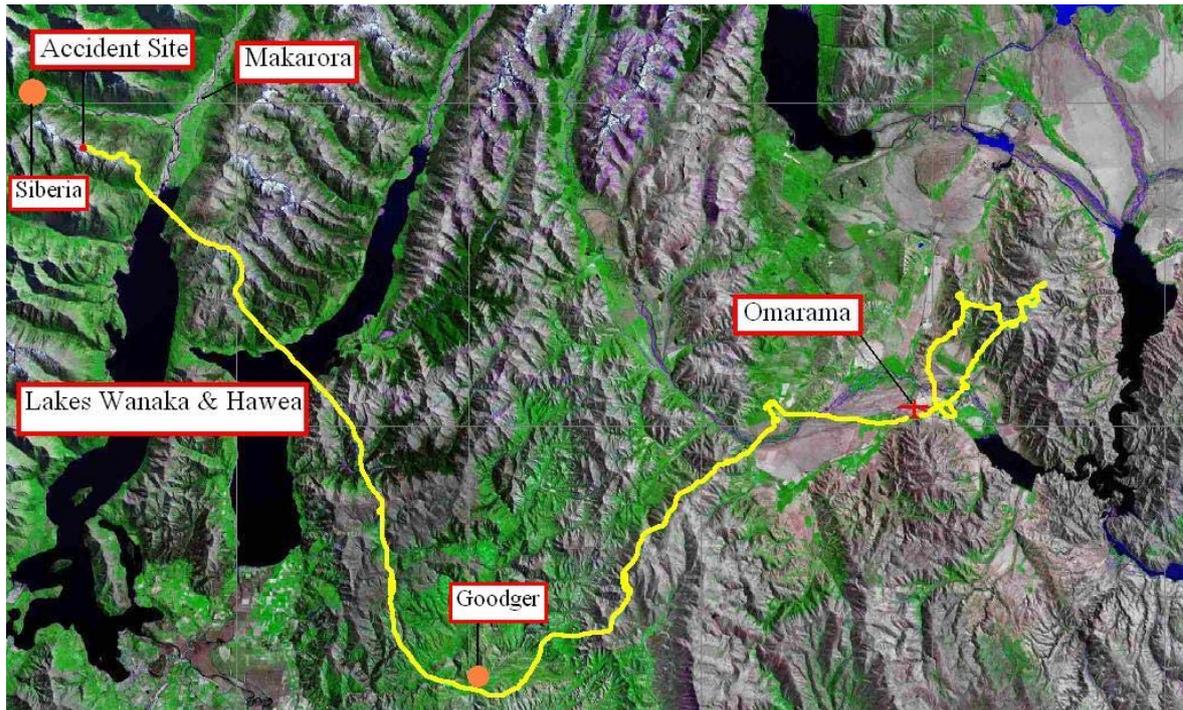


Figure 1. The route flown by D-2929 as recorded by the Zander data unit

1.11.3 The glider was also equipped with GPS based telemetry hardware installed by Animation Research Ltd. Each glider's real time data was used to produce a 3D animation of their positions and flight paths over a local terrain map so a worldwide television and internet audience could follow the competition in real time. This data was stored at the production site and provided a valuable source of information about the flight path of D-2929

1.11.4 The data from the other two gliders that were in company of D-2929 was also retrieved so that each glider's progress and performance could be compared.

1.12 Wreckage and impact information

1.12.1 The glider struck a small spur that extended out from the main mountain slope and then parallel back toward the pilot's flight path. The glider struck the lower slopes of this spur about half a meter below its ridgeline line while banked over to the right approximately 30 degrees. The slope of the ridgeline at the point of impact was also approximately 30 degrees (see Figure 2).



Figure 2. Photograph showing accident site, flight path and angle of bank.

1.12.2 After striking the spur the glider bounced into the air and rotated before coming to rest inverted about four metres from the initial impact point. During the impact sequence the right wing created a very distinctive straight line impression in the moss just below the ridge line and both wings were split open along their leading edges. Both winglets had also detached and were lying nearby. The tail boom section showed signs of twisting and had broken just aft of the fuselage wing junction and at the tail fin section. The left wingtip skid pad was found pressed down into the ground on the top of the spur providing evidence that the wing had tapped the ground with a vertical component before the glider rolled over.

1.12.3 Based on data recovered, the glider's groundspeed was estimated to be about 120 kph at initial impact.

1.12.4 The integrity of the flight control systems was established and all parts of the glider were accounted for at the accident site.

1.13 Medical and pathological information

1.13.1 Post-mortem examination revealed that the pilot died of severe multiple injuries consistent with a high speed impact.

1.13.2 No evidence was found of any pre-accident incapacitation or pre-existing condition which may have contributed to the accident.

1.13.3 The toxicology tests did not reveal anything which may have affected the pilot's performance.

1.14 Fire

1.14.1 There was no fire.

1.15 Survival aspects

1.15.1 The accident was not survivable due to the high deceleration forces involved. During the flight the pilot was restrained by a combination lap and shoulder harness. Any significant longitudinal impact in this type of aircraft usually results in the destruction of the cockpit area with consequent effects on the pilot. The impact forces in this case were so great that the seatbelt's attachment points failed and the pilot was ejected forward and clear of the wreckage.

1.16 Tests and research

1.16.1 Not applicable.

1.17 Organisational and management information

1.17.1 Not applicable.

1.18 Additional information

1.18.1 The other two glider pilots who were flying in close proximity to D-2929 described its flight path as being very close to the terrain and generally following the contours of the mountain face. This was also verified when the retrieved data was replayed in a simulation program.

1.19 Useful or effective investigation techniques

1.19.1 The IGC data recovered from the glider's data recorder was replayed in a 3D animation program along with the other two gliders that were in the lead group. This program showed that all three gliders were relatively close during that leg of the course.

1.19.2 It should be noted that this program does not create the exact flight paths flown in respect to the terrain or each other, however it does provide valuable insight into how the flight(s) proceeded and performed.

2. Analysis

2.1 The pilot was a highly experienced as evidenced by his results and achievements at international and national gliding events.

2.2 The possibility of an aircraft flight control malfunction was eliminated by the on-site examination.

2.3 The post mortem examination and toxicology results suggest that it was unlikely that an in-flight incapacitation event had occurred.

- 2.4 In view of the fact that the other two pilots saw the glider generally flying very close to the mountain slopes, it is possible that the pilot of D-2929 may have encountered unexpected severe local turbulence and downdrafts as he turned away from the mountain face. These conditions may have contributed to the glider being unable to clear the spur ridge line that it collided with.

3. Conclusions

- 3.1 The pilot was appropriately qualified for the flight and met the FAI competition experience requirements.
- 3.2 The pilot was assessed as medically fit to fly and most likely had not suffered any in flight incapacitation.
- 3.3 The glider had a valid Permit to Fly and it had been maintained in accordance with the manufacturer's requirements.
- 3.4 The glider had no known defects which would have affected its performance.
- 3.5 The forecast weather conditions were favourable for the glider competition.
- 3.6 Whilst manoeuvring in the close vicinity of a mountain ridge, the pilot probably encountered sink and or severe local turbulence and was unable to maintain terrain clearance.
- 3.7 The accident was not survivable.

Report written by:

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Safety Investigator
21 October 2008