

AA2022-2

**AIRCRAFT ACCIDENT
INVESTIGATION REPORT**

**KITA-KYUSHU GLIDER CLUB
J A 2 1 8 9**

June 30, 2022

The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board and with Annex 13 to the Convention on International Civil Aviation is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

TAKEDA Nobuo
Chairperson
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

(Reference)

The terms used to describe the results of the analysis in "3. ANALYSIS" of this report are as follows.

- i) In case of being able to determine, the term "certain" or "certainly" is used.
- ii) In case of being unable to determine but being almost certain, the term "highly probable" or "most likely" is used.
- iii) In case of higher possibility, the term "probable" or "more likely" is used.
- iv) In a case that there is a possibility, the term "likely" or "possible" is used.

AIRCRAFT ACCIDENT INVESTIGATION REPORT

May 27, 2022

Adopted by the Japan Transport Safety Board



Chairperson TAKEDA Nobuo
Member SHIMAMURA Atsushi
Member MARUI Yuichi
Member SODA Hisako
Member NAKANISHI Miwa
Member TSUDA Hiroka

Company	Kita-Kyushu Glider Club
Type, Registration Mark	Alexander Schleicher ASK13 (Glider, Two-Seater) JA2189
Incident Class	Damage to the airframe upon landing
Date and Time of the Occurrence	At 12:48 Japan Standard Time (JST: UTC+9 hours), October 10, 2021
Site of the Accident	Aso Temporary Airfield, Aso City, Kumamoto Prefecture (33°00'32" N, 131°05'55" E)

1. PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

Summary of the Accident	When the glider with solo trainee onboard for training flight landed at the Aso Temporary Airfield in Aso City, Kumamoto Prefecture, deviated from the runway, collided with shrub. The glider sustained substantial damage, but the pilot was not injured.
Outline of the Accident Investigation	<p>On October 11, 2021 an investigator-in-charge and an investigator were designated, to investigate this accident.</p> <p>An accredited representative of the German Republic was designated as the State of Design and Manufacturer of the aircraft participated in the accident.</p> <p>Comments were invited from the parties relevant to the cause of the accident. Comments on the draft final report were invited from the Relevant State.</p>

2. FACTUAL INFORMATION

Aircraft Information	
Aircraft type:	Alexander Schleicher ASK13
Serial number: 13526	Date of manufacture: December 9, 1975
Airworthiness certificate: No.2021-47-05	Validity: October 8, 2022
Personnel Information	
Trainee:	Age: 65
Student pilot permit	Validity: September 7, 2022
Total flight time:	7 hours 24 minutes

Flight time in the last 30 days:	0 hour 24 minutes
Flight instructor (instructing from the ground):	Age: 75
Private pilot certificate (Glider):	July 31, 1968
Flight instructor certificate:	July 21, 1969
Specific pilot competence certificate:	Expiry of practicable period for flight: June 26, 2023
Class 2 aviation medical certificate:	Validity: August 31, 2022
Total flight time:	536 hours 01 minutes
Flight time in the last 30 days	0 hour 19 minutes

Meteorological Information

Wind direction and wind velocity recorded in the flight log.

Time 12:43; Wind direction 100°; Wind velocity 5 m/s

Minami-Oguni observation station of the Meteorological Agency (approximately 12 km north- northwest of the accident site) as of 12:50 on the day of the accident

Wind direction and wind velocity: south-southeast 4.6 m/s, maximum south-southeast 8.3 m/s, temperature 28.4°C

Event Occurred and Relevant Information

(1) History of the flight

On the day of the accident, the trainee conducted two dual flight with the instructor, recognized to have a stable flight skill including take-off and landing, so solo flight was permitted. At 12:43, the glider was launched by winch with the trainee in the front seat as twelfth solo flight.

The glider climbed to 340m above ground level (AGL), and released the cable. After conducting one 360 degree right turn, the glider passed the check point* 1 at 200m AGL and commenced landing approach.

As the altitude at the check point was a little higher than the usual 180m AGL, the trainee push out

the base turn beyond the road which is usually used as the reference point.

As a result of this decision, distance between the Final turn and touchdown target point became far and the final approach path became too low. As the trainee felt that the final approach path was considerably low, the trainee did not extend the dive brakes which usually opened soon after the Final turn. The flight instructor found the glider was low and transmitted

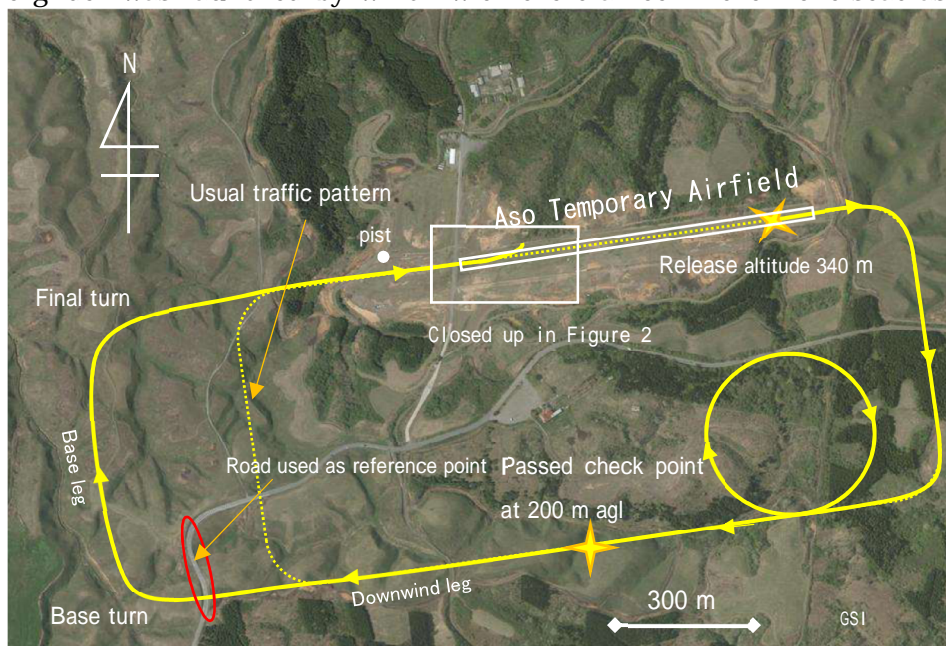


Figure 1 Flight route of accident glider (from statement)

* 1 "check point" is a point that is established on the downwind leg on the side of touchdown point, where landing approach commence. When passing the check point, landing intention is notified by radio and confirm altitude.

with radio, “Do not use the dive brakes.”

In the final approach path, the glider appropriately took the drift correction angle against crosswind, and the approach direction aligned with the runway. As the glider was approaching the ground, when the trainee was thinking that he or she should align the glider to the runway, the glider banked to the right due to gust wind. The trainee attempted to correct it to the left, and the glider banked and faced to the left more than expected due to over control and touched down. As the glider was running toward shrub bush, the trainee attempted to avoid it by applying the right rudder but could not stop the glider from deviating to the left. When the glider came near the bush on the side of the runway, the left wing collided with the shrub and the glider spun left. When the trainee noticed, the glider turned almost half and stopped in the bush.

The glider sustained damage to the left wing from the collision with the shrub, and the tail section twisted and the steel pipe near the tail wing buckled by the collision of the tail wheel with the ground when the glider subsequently swung to the left.

(2) Final approach path distance

Glider usually fly by establishing traffic pattern 600m downwind leg width and base leg 600m from the touchdown point. Flight training was conducted likewise at the Aso Temporary Airfield as well by establishing traffic pattern. Normally base turn commenced in reference to the road shown in Figure 1, but at this flight, as the trainee intentionally went beyond the road for he or she was higher altitude at the checkpoint, as a result, approach length which is usually 600m, became 900m, 1.5 times longer.

(3) Wind and terrain around the temporary airfield

Confirming the terrain of the southeastern side of the approach path, elevation of the area along the road is high and forming a hill. On the day of the accident, wind was from southeast (100° and 5 m/s), and at the touchdown point, a slightly strong wind coming over from the hill was blowing. According to the flight log of the day of the accident, wind direction and wind velocity were variable between 40° and 100° and 4 m/s and 6 m/s.

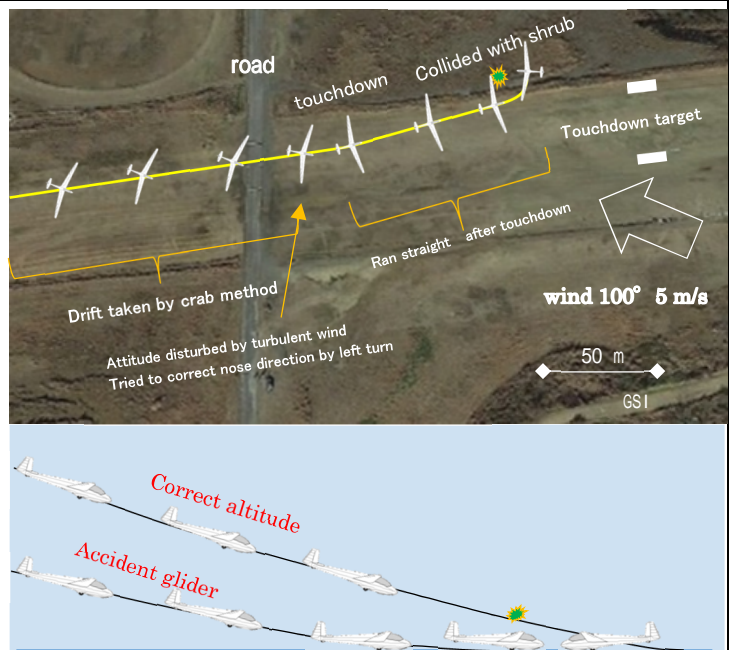


Figure 2 Flight route of accident glider (Closed up)

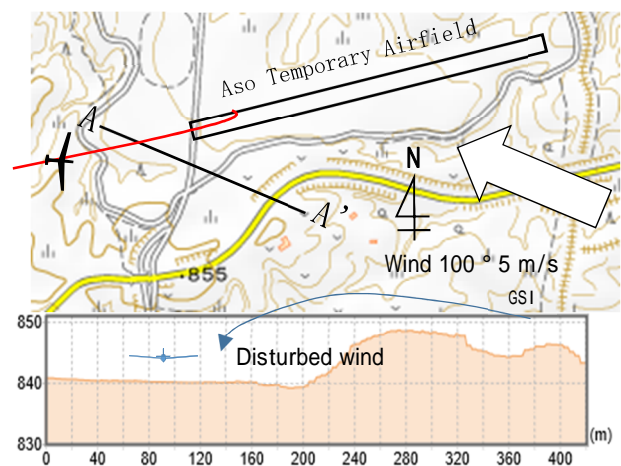


Fig. 3 Terrain and winds in surroundings of airfield (A-A' cross section)

(4) Crosswind landing

“Kaze wo kike (Listen to the wind)- Glider Pilot’s Flight Manual Basics” by MARUI Mitsuru (published by Kantosha on September 15, 1992,p.126) includes following descriptions regarding crosswind landing crab method :

Procedures for crab method

1. *Keep aligned with runway by modifying the drift angle depending on the crosswind intensity in approaching.*
2. *Just before commencing flare (at an altitude of some 2 m) apply the rudder on the leeward side and align the glider with the runway direction. Bank the airframe to the windward side in order not to be blown by the wind. Transition to Side Slip*². (partially omitted)*

*Note 2: Transition to Side Slip is required just before flare, which is to be conducted instantaneously using cross control*³. (the rest omitted)*

(5) Safety criteria relating to solo flight

“Safety criteria relating to solo flight (glider)” issued by the Civil Aviation Bureau of Japan(Kuujo No. 2103 dated December 18, 1997), includes following descriptions:

I Take-off and landing and maneuvering in the air

1. Establishment of restricted weather conditions

1) Appropriate minimum weather conditions to secure safe flight shall be established based on the criteria described below for each curriculum in consideration of performance of the glider in use, air traffic amount, various factors of training airport, obstacles, and topography of surroundings, etc.

Ground and flight visibility: 5,000 m or more

Cloud height: 400 m or more

(on condition of no precipitation and no cloud at 300 m or less)

Headwind: 5 m or less

Crosswind component force 3 m or less

3. ANALYSIS

(1) Influence of the wind in the accident flight

From the flight log, at the time of the accident, wind was 100° and 5 m/s which is crosswind blowing 20° from the right of the runway direction. In addition, it is probable that there were turbulent wind around the touchdown point which was blowing over from the hill on the southeastern side of the final approach.

It is probable that the wind conditions at the time of the accident was within the extent of “Safety criteria relating to solo flight”, however, considering fluctuation in wind direction and velocity, it was slightly severe for the trainee to conduct solo flight. It is probable that because extending base turn location has become excessive adjustment and the altitude of the final approach path was lower than normal in the slightly strong headwind.

(2) Maneuvering operations of the trainee

It is probable that the trainee held a certain level of proficiency from the 11 solo flights before the accident and approached for landing corresponding to the crosswind from the right by crab method. However, just before touchdown, when transiting to side slip, it is probable that

* 2 “side slip” is a way to keep the align runway by banking the glider and slipping it in the windward side.

* 3 “cross control” In the normal turn control, aileron and rudder are used in same direction, but in cross control, aileron and rudder are used opposite. In case of crosswind landing, the glider is intentionally slip to stay aligned with the runway.

the glider banked to the right due to turbulent wind over from the hill, the trainee made correction to the left which resulted as overcontrol, and the glider touchdown with the nose facing slightly leeward. It is probable that the trainee failed to make appropriate corrections as the final approach was lower than normal, and the trainee could not react calmly. The trainee attempted to prevent runway deviation by applying the right rudder after touchdown, but the glider speed was already too slow for rudder to work to prevent the deviation.

4. PROBABLE CAUSES

The JTSB concludes that when the glider attempted the crosswind landing, the attitude was disturbed due to the wind just before the touchdown, the probable cause of the accident was the trainee could not correct appropriately. Therefore the glider touched down with the nose facing the leeward left direction deviated the runway, collided with shrub and sustained damage.