

AA2023-1

# **AIRCRAFT ACCIDENT INVESTIGATION REPORT**

**The General Incorporated Association Tokai/Kansai Student Aviation League  
J A 2 1 5 1**

**February 16, 2023**

 **JTTSB** *Japan Transport Safety Board*

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

January 27, 2023

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

<b>Company</b>	The General Incorporated Association Tokai/Kansai Student Aviation League
<b>Type, Registration Mark</b>	Alexander Schleicher ASK13 (Glider, Two-Seater), JA2151
<b>Incident Class</b>	Injury to a person on board upon landing
<b>Date and Time of the Occurrence</b>	At about 09:58 Japan Standard Time (JST: UTC+9 hours), March 21, 2022
<b>Site of the Accident</b>	Kisogawa Gliding Field, Kaizu City, Gifu Prefecture (35° 12' 22" N, 136° 40' 43" E)

## 1. PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

<b>Summary of the Accident</b>	The glider was launched from Kisogawa Gliding Field, Kaizu City, Gifu Prefecture only with a pilot trainee onboard for solo flight training, and when landing at the Gliding Field, it made a hard landing, and the solo trainee was seriously injured.
<b>Outline of the Accident Investigation</b>	The Japan Transport Safety Board (JTSB) designated an investigator-in-charge, and one investigator on March 28, 2022, when the occurrence of the accident was reported.  Comments were invited from the parties relevant to the cause of the accident and the Relevant State.

## 2. FACTUAL INFORMATION

<b>Aircraft Information</b>	
Aircraft type:	Alexander Schleicher ASK13
Serial number: 13425	Date of manufacture: March 8, 1973
Airworthiness certificate: 2021-35-09	Validity: October 23, 2022
<b>Personnel Information</b>	
(1) Trainee:	Age: 22
Student pilot permission	Validity: August 18, 2022
Total flight time (Number of landings)	20 hours 09 minutes (142 landings)
Flight time on the type of the aircraft	19 hours 48 minutes (141 landings)
Flight time in the last 30 days (Number of landings)	0 hour 07 minutes (1 landing)
(2) Flight instructor:	Age: 64

Private pilot certificate (High class glider)	August 30, 1979
Flight instructor certificate (Glider)	December 13, 1980
Specific Pilot Competence Expiry of practicable period for flight	February 4, 2024
Class 2 aviation medical certificate	Validity: February 16, 2023
Total flight time	2,886 hours 52 minutes
Flight time in the last 30 days	0 hour 43 minutes

**Meteorological Information**

According to the statement of the flight instructor, the wind at the Gliding Field on the day of the accident was coming from about 330° at a velocity of about 2 m/s.

**Event Occurred and Relevant Information**

(1) History of the flight

At about 09:38 on March 21, 2022, on the first day of the pilot training camp in which several universities participated, the pilot trainee (hereinafter referred to as “the Trainee”) conducted the first flight on the day with the flight instructor, and was recognized to have stable flight skills including take-off and landing, therefore, solo flight was permitted. In addition, the Trainee conducted the fifth solo flight on January 30, 2022, and conducted the last flight before this accident with the flight instructor on January 31, 2022.

At about 09:51, the glider was launched from Runway 36 at Kiso-gawa Gliding Field with the trainee in the front seat for solo flight training. The flight instructor was standing next to the piste (command post), holding a microphone, and supervising the flight of the glider being able to communicate with the glider by radio. The glider released the tow line at an altitude of about 530 m, turned to the right to enter the flight training airspace, and conducted flight training such as a 360 degree-turn and others. After that, the glider passed the checkpoint\*1 at an altitude of about 210 m. The base turn was completed at an altitude of about 180 m, which was 30 m higher than the target of 150 m, therefore, the Trainee slightly extended the dive brakes.\*2 As the flight instructor believed that the Trainee could correct the altitude by themselves, the flight instructor did not give any specific instructions. As the final turn was completed at an altitude of about 150 m, which was still about 30 m higher than the target of 120 m, the Trainee fully extended the dive brakes and continued to approach the runway. The flight instructor instructed the Trainee to extend the dive brakes, feeling that the altitude was a little higher after the final turn. The trainee lowered the altitude as well as continued approaching



Figure 1: Estimated flight route

After that, the glider passed the checkpoint\*1 at an altitude of about 210 m. The base turn was completed at an altitude of about 180 m, which was 30 m higher than the target of 150 m, therefore, the Trainee slightly extended the dive brakes.\*2 As the flight instructor believed that the Trainee could correct the altitude by themselves, the flight instructor did not give any specific instructions. As the final turn was completed at an altitude of about 150 m, which was still about 30 m higher than the target of 120 m, the Trainee fully extended the dive brakes and continued to approach the runway. The flight instructor instructed the Trainee to extend the dive brakes, feeling that the altitude was a little higher after the final turn. The trainee lowered the altitude as well as continued approaching

\*1 The checkpoint is a point that is established on the traffic pattern on the side of the touchdown point, and the landing approach commences from there. When passing the checkpoint, an intended landing approach is notified by radio and the altitude is confirmed.

\*2 Dive brakes extend from both the upper and lower surfaces of the wing and help to increase the decent rate by increased aerodynamic drag and decreasing aerodynamic lift.

by the crab method.\*<sup>3</sup> After a while, the Trainee noticed that the approach path was deviated to the left from the touchdown target of the four white strips put on the runway. The Trainee was concentrated on correcting the speed and the approach path and continued to carefully watch the touchdown target, but when the trainee realized, the glider had passed 5 m in altitude, which is the reference for an operation to flare. Without reducing the descent rate, the glider made the first touchdown beyond the touchdown target and bounced. After the Trainee closed the dive brakes following the instruction from the flight instructor saying, “Close the dive”, the glider made the second touchdown at about 34 m forward, and the Trainee felt pain when their back was hit hard. After bouncing again and making the third touchdown at about 31 m forward from the second touchdown point, it ran on the ground. The Trainee extended the dive brakes to apply the brakes, and the glider stopped at about 36 m forward from the third touchdown point. (See Figure 2) Post-flight inspection found cracks in the cut-off places of the left aileron and a part of the trailing-edge of both the right and left main wings. The Trainee was diagnosed with a fracture on March 27, 2022.

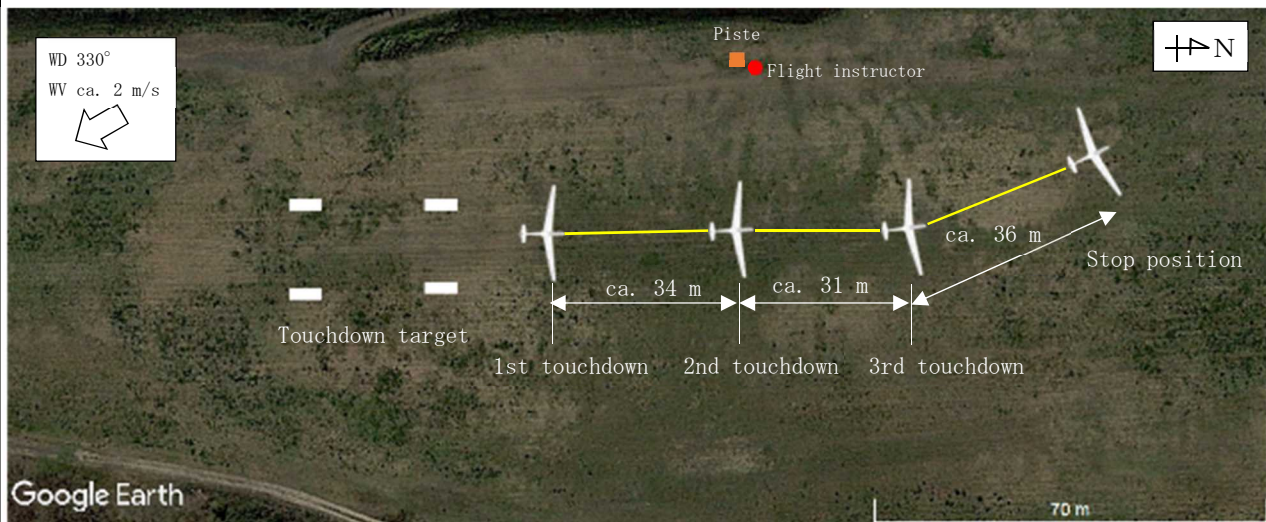


Figure 2: Estimated flight route (detail)

(2) 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), provides the following. (Excerpts)

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 volume, various factors of training airfield, obstacles, and topography of surroundings, etc.*

(Omitted)

*Headwind:* 5 m or less

*Crosswind component force:* 3 m or less

(Omitted)

3. *Implementation of Flight*

1) *A student pilot shall have the confirmation of skills for the first solo flight permission with more than two instructors including the instructor in charge (preferably a chief*

\*<sup>3</sup> “Approaching by the crab method” is a way to approach on the path aligned with runways and others by taking the wind correction angle windward so as not to be blown by the side wind.

*instructor inclusive).*

*2) The confirmation of skills for take-off and landing including emergency procedures precedes the first solo flight.*

*3) In case of no flight training within a week, a student pilot shall have a confirmation of skills before the solo flight.*

*4) Until a student pilot accumulates three solo flights, a flight with an instructor is mandatory for the next solo flight.*

*(Omitted)*

In addition, regarding the criteria for the instructor to grant solo flight, the Training Manual for Glider Sports of the Japan Students Aviation League provides the following. (Excerpts)

*3-23. An instructor shall grant solo flight to a student pilot after confirming the following matters in accordance with safety criteria relating to solo flight (Kuujo No. 2103 dated December 18, 1997).*

*(1) Confirmation of skills:*

*Regarding the solo flight for a student pilot who had not accumulated three solo flights, the student pilot's flight skills including the stability shall be confirmed in each flight with multiple instructors, or in multiple flights with a single instructor.*

*The instructor shall confirm proficiency in flight skills before the student pilot who has not flown for more than one week in a row before the solo flight. And regarding the solo flight for a student pilot who had not accumulated ten solo flights until the first day of the training camp, the skills including the stability shall be confirmed in each flight with multiple instructors or in multiple flights with a single instructor.*

(3) Confirmation of the trainee's skills conducted by flight instructor to grant solo flight

In the first flight with the Trainee on the day, the flight instructor recognized that the Trainee had good flight skills and especially the landing was stable, thus he thought that it would be better for the Trainee to proceed to make a solo flight soon after that, and grant him solo flight in the second flight. However, at that time, the flight instructor had forgotten that a flight instructor had to grant solo flight after confirming the flight skills of the student pilot in multiple flights in accordance with the Training Manual for Glider Sports.

### 3. ANALYSIS

(1) Influence of the wind in the accident flight

The JTSB concludes that at the time of the accident, the wind was about 330° and 2 m/s, therefore, it was most likely within the range of the "Safety criteria relating to solo flight (glider)".

(2) Flight Operations at the time of landing

a. The JTSB concludes that the Trainee commenced landing approach while not being able to lower the altitude sufficiently, and fully extended the dive brakes until the landing, thus the descent rate became higher than usual, and the flare operation was delayed due to the Trainee concentrating on correcting the speed and approach path, which was highly probable in resulting in the failure to reduce the descent rate of the glider. Therefore, the glider made a hard landing and bounced several times. The Trainee was most likely injured due to the impact of the second touchdown when the speed became slower than that in the first touchdown and the lift decreased.

b. The JTSB concludes that although the flight instructor gave only instructions to "Close the dive" after the glider made the first touchdown and bounced, if the Trainee had been

able to flare the glider before the second touchdown, the impact could have likely been reduced even a little.

(3) Flight skill confirmation for solo flight

The JTSTB concludes that according to the Training Manual for Glider Sports of the Japan Students Aviation League, the flight skills of the Trainee should have been confirmed in each flight with multiple instructors, or in multiple flights with a single instructor, however, the confirmation of the Trainee’s flight skill was not done in accordance with the procedures provided in the Training Manual for Glider Sports, therefore, it is possible that the flight skills of the Trainee could not be properly ascertained.

It is necessary that when granting solo flight to the trainee, their flight skills be confirmed according to the procedures as stipulated.

#### 4. PROBABLE CAUSES

The JTSTB concludes that the probable cause of this accident was that the Trainee made a landing approach on the path higher than usual with the dive brakes fully extended, thus the descent rate became higher than usual, and the flare operation was delayed due to the Trainee concentrating on correcting the speed and approach path, which was highly probable in the cause of the glider to make a hard landing and bounce and the Trainee to be seriously injured due to the impact of the second touchdown.

#### 5. SAFETY ACTIONS

<p><b>5.1 Safety Actions Considered Necessary</b></p>	<p>As described in “3. ANALYSIS”, it is necessary that when granting solo flight to the trainee, their flight skills be confirmed according to the procedures as stipulated by making the stipulated procedures known to all concerned again. In addition, it is desirable to consider the methods for flight instructors to give appropriate instructions depending on the situation.</p>
<p><b>5.2 Safety Actions Taken after the Accident</b></p>	<p>The Japan Students Aviation League, of which the Tokai/Kansai Student Aviation League is a member, took the following safety actions after the accident.</p> <p>(1) Dissemination of notices, regulations and others related to solo flight</p> <p>They disseminated the regulations related to solo flight, which were based on the “Safety criteria relating to solo flight (glider)” issued by the Civil Aviation Bureau of Japan and the “Training Manual for Glider Sports” of the Japan Students Aviation League, to instructors and students. In addition, they held safety seminars.</p> <p>(2) Confirmation of the requirements for solo flight planners</p> <p>They decided that the instructor and the student manager should confirm the status of the solo flight planner and the requirements of the regulations at the start of the flight training.</p>