AA2016-5

# AIRCRAFT ACCIDENT
# INVESTIGATION REPORT

**PRIVATELY OWNED**
**J A 0 7 K D**

**June 30, 2016**

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.

Kazuhiro Nakahashi
Chairman,
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.

# AIRCRAFT ACCIDENT INVESTIGATION REPORT

## CRASH DURING LAUNCHING

## PRIVATELY OWNED

## SCHEMPP-HIRTH DUO DISCUS

## (GLIDER, TWO-SEATER),

## JA07KD

## KIRIGAMINE GLIDING FIELD,

## SUWA CITY, NAGANO PREFECTURE, JAPAN

## AROUND 12:36 JST, MAY 30, 2015

June 3, 2016
Adopted by the Japan Transport Safety Board

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| Chairman | Kazuhiro Nakahashi |
| Member | Toru Miyashita |
| Member | Toshiyuki Ishikawa |
| Member | Sadao Tamura |
| Member | Keiji Tanaka |
| Member | Miwa Nakanishi |

# 1 PROCESS AND PROGRESS OF THE INVESTIGATION

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| 1.1 Summary of the Accident | On Saturday, May 30, 2015, privately owned Schempp-Hirth Duo Discus, registered JA07KD, launched from Kirigamine Gliding Field by winch launching for familiarization flight. During launching, the towline broke, and then the glider crashed.<br>Two people were seriously injured. Though the fuselage was destroyed, there was no outbreak of fire. |
| 1.2 Outline of the Investigation | The Japan Transport Safety Board designated an investigator-in-charge and an investigator to investigate the accident on May 30, 2015.<br>An accredited representative of Federal Republic of Germany as the State of Design and Manufacture of the aircraft involved in the accident, participated in the investigation. Comments were invited from parties relevant to the cause of the accident and relevant State. |

# 2 FACTUAL INFORMATION

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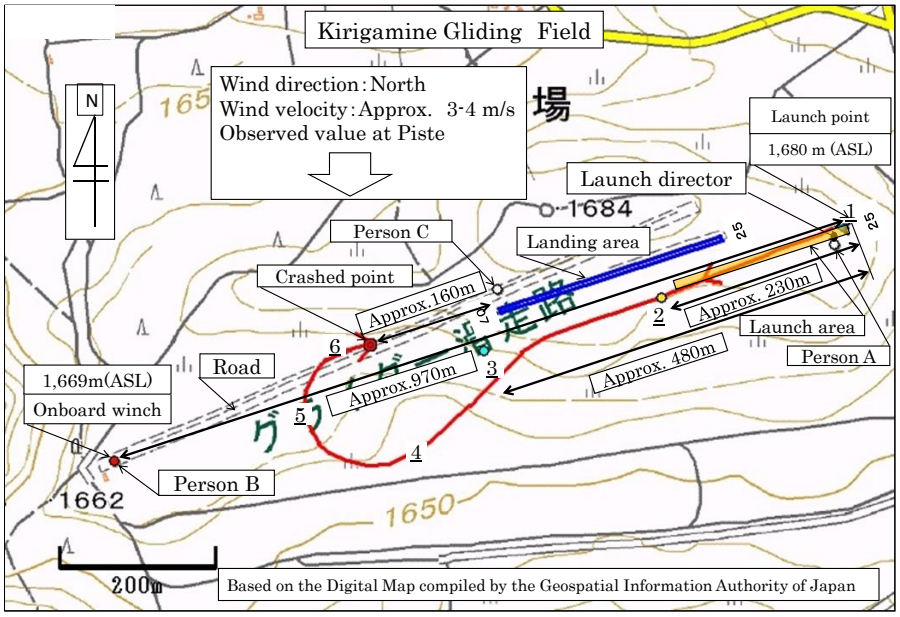
| **2.1 History of the Flight** | According to the statements of the captain, the passenger onboard and the relevant people of the Suwa City Glider Association and the records of the GPS receiver (hereinafter, referred to as "GPS") which was installed, the history of the flight is summarized below:<br>On May 30, 2015 privately owned Schempp-Hirth Duo Discus, registered JA07KD launched by winch launching from the runway 25 of Kirigamine Gliding Field for familiarization flight with the captain sat in the front seat and the passenger sat in the rear seat onboard, at around 12:35 Japan Standard Time(JST): UTC+9hours).<br>The captain felt an impact while the glider was climbing in pitch angle at about 20°-30°, and at the same time he received the instruction "Wire cut red[*1]" by the launch director.<br>Although the captain did not confirm the altimeter, according to the statement of a relevant person A who was near the launching point, the altitude above ground level at that time was about 30-40 m; on the contrary, it was about 50 m by the passenger's statement. The captain released the towline which remained on the airframe side immediately by pulling the release (towline release device) handle and he stabilized the glider by making it nose-down attitude for accelerating.<br>The captain decided to make 180° right turn to land on the grass area around the landing area because the air brakes[*2] of the glider would not be effective, he judged that if he had made straight landing; would have collided with the winch.<br>The captain recognized that there was not enough altitude, and he estimated it' s loss by turning was about 20 m, then he began the right turn after having turned the nose to the left once to enlarge the turning radius. At this time, the air speed indicator of the glider was indicating about 100 km/h.<br>The captain stated that the glider suddenly descended its altitude and it crashed while he continued turning targeting to the grass area near landing area and that the effect of the rudder became worse by the influence of its airspeed decrease due to sudden down draft.<br>Regarding the situation at that time, the relevant person B who was at the winch position stated that the glider was slowly turning right at the bank angle of about 20° at first but it suddenly descended its altitude above the vicinity of the road that runs from east to west in the center of the gliding field. The bank angle increased to about 45°-50° and it crashed after turning with a wingtip as the fulcrum to the right having contacted it with the ground. The relevant person C who was on the north side of the landing area stated that the glider's turning circle for landing became wide to the north side and the bank angle increased when it crashed.<br>The glider halted at the point of about 160 m west-southwest from the west end of the landing area, heading its nose almost south. Moreover, fractured fuses[*3] were found at the point about 480 m west-southwest from the launched point.<br>The accident occurred at the Kirigamine Gliding Field (Latitude 36 °5' |

[*1] "Wire cut red" is a warning which is issued when abnormalities occur during winch launching, meaning that the glider side should release the towline and winch side should stop winding.

[*2] "air brakes" are rectangle boards built into the main wings, which are used to reduce lift and altitude by protruding upward when airborne.

[*3] "fuse" is a safety device which is installed between fuselage and towline, it prevents destruction of fuselage by rupturing itself when larger force than specified value added to the towline.

36" N, Longitude 138 ° 9' 41" E) and at around 12:36 on May 30, 2015.




1 Launched position 2 Fuse broken position 3 Fuse fell position
4 Starting right turn position 5 Bank angle increased position
6 Contact marks of right wing tip

Figure: The Estimated Flight Route

## 2.2 Injuries to Persons

The captain and the passenger were seriously injured.

## 2.3 Damage

Extent of damage Destroyed
- Fuselage Rear part fractured
- Main wings Left main wing tip broken and right main wing fractured
- Empennage Right horizontal stabilizer broken

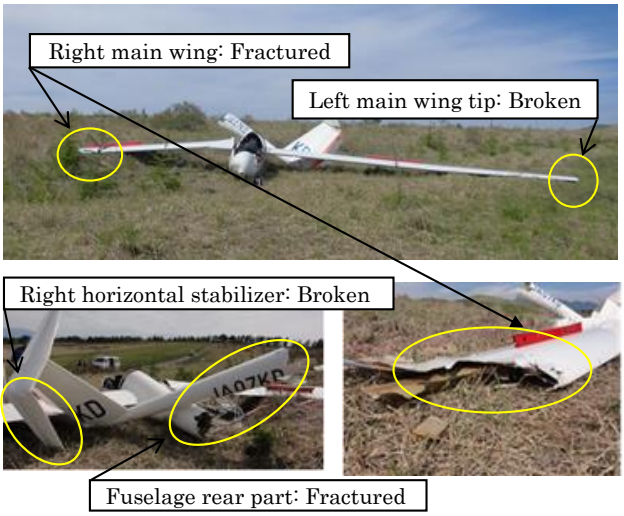



Photo 1 Accident Aircraft

## 2.4 Personnel Information

Pilot Male, Age 66
Private pilot certificate (Glider) October 30, 1970
Type rating for High-class glider October 30, 1970
Pilot Competency Assessment/ Confirmation
Expiration date of piloting capable period October 14, 2016
Class 2 aviation medical certificate Validity: June 22, 2015
Total flight time: 659 hours and 13 minutes(1,063 launches)
Total flight time on the type of aircraft: 81 hours and 17 minutes (69 launches)

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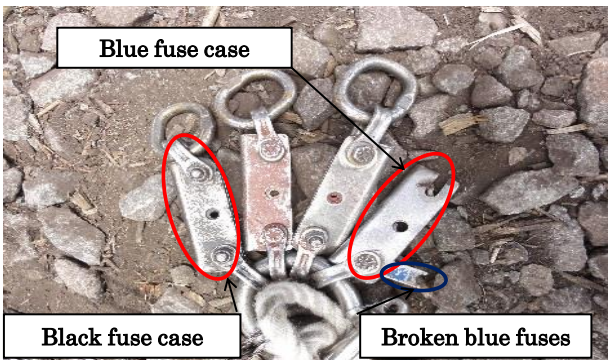
| **2.5 Aircraft Information** | Type: Schempp-Hirth Duo Discus<br>Serial number: 415 Date of manufacture: May 6, 2004<br>Certificate of Airworthiness No. 2014-33-23, Validity: August 21, 2015<br>Category of airworthiness Glider, Utility U<br>Total flight time 435 hours and 18 minutes<br>Stall speed 60 km/h<br>Best glide ratio 45:1 |
| **2.6 Meteorological Information** | According to the observation by the launch director, the weather at the vicinity of the accident site was clear, wind direction north ; wind velocity 3-4 m/s and visibility more than 10 km.<br>According to the relevant people of Suwa Glider Association to which the captain belongs, in the case of north wind, the gliding field has the characteristic that it turned to be down draft in the vicinity of the central area because it is located on the south slope of the Kirigamine Highland. Therefore, in the case of the day of the wind direction and wind velocity, the strength of the down draft was estimated about 0.5-4 m/s on experience. |
| **2.7 Additional Information** | (1) Regarding the characteristics of the gliding field<br>The glideing field is located on the south slope of Kirigamine Highland at an altitude of 1,680 m, there is an onboard winch at the west edge of the field at an altitude of 1,669 m.The distance from the launch point to the winch is about 970 m. The runway for landing is different from that for launch. The runway (landing area) 07/25 are used for landing and the runway (launching area) 25 is used only for launch.<br>(2) The winch condition<br>There were no malfunctions in the operation of the winch and the towline which used on the day of the accident.<br>(3) The fuse conditions<br>The fuses are color coded by the tensile intensity. Although the black fuses are usually mounted in the glider, the blue fuses which have lower intensity were mounted when it launched.<br>The person in charge of attaching the towline to the tow hook stated that he had misidentified the fuse case because its color was faded by the aged deterioration in addition to that he worn sunglasses.<br>  <br><br>Photo 2 Fuse case and fuses used for the Glider<br>(4) Records of the GPS<br>The location information from the launched point to the point (4 in the Figure : The Estimated Flight Route) where the right turn began for landing was recorded in the GPS of the glider. Moreover, the pressure altitude was in it, and at an altitude of about 1,710 m at launched point and at an altitude of 1,760 m at the highest point (above the vicinity of 3 in the Figure) were recorded. From the fact that the actual altitude of the launch point was 1,680 m and the altitude deviation between launch |

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| | point and the heighest point which were recorded in the GPS was 50 m, it is probable that the actual altitude of the highest point was about 1,730 m.<br>(5) Measures against towline break at low altitude by the association<br>The association made a inspection flight using two-seater glider ASK 13 (best glide ratio 27:1) on September, 2005 and published "Cope with the towline break at the waver altitude (low altitude)" to be known to the members of the association.The summary of the part that relates to this accident in common knowledge is as follows:<br>In the case of no head wind, the altitude that is possible to make straight landing is less than 80 m.<br>In the case of the straight landing, approach path shall be steep and the range of the air brake extension is 2/3 open to full open.<br>In the case of performing circling landing (360° turn), south-side (left) turn should be performed regardless of the wind direction due to geographical characteristics. In the second half of turning, otherwise it is necessary to be cautious, because the flight becomes toward the hill. Thus the glider is prone to nose up due to geographical influence and it might lead to reducing speed.<br>Moreover, the association made the chart which clarify the unsuitable places for landing and landing procedures when it becomes tow discontinuance (secession) at low altitude after launch as measures after the accident of the fuselage damage occurred at the gliding field on November 8, 2014 and these were known to the members before starting of activities of 2015 fiscal year. |

# 3 ANALYSIS

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| **3.1 Involvement of weather** | Yes |
| **3.2 Involvement of Pilot** | Yes |
| **3.3 Involvement of Aircraft** | No |
| **3.4 Analysis of Findings** | (1) Relations to the meteorological conditions<br>It is probable that there was a down draft in the vicinity of center area of the gliding field because the north wind at 3 to 4 m/s was blowing there at the time of the accident occurred and there is the characteristic that the down draft blows in the case of north wind. Therefore it is somewhat likely that this was involved in the sudden altitude descent during the turning of the glider.<br>(2) Breakage of fuses<br>Regarding the breakage of fuses at launching, it is highly probable that the low intensity fuses were mounted incorrectly. It is probable somewhat likely that involvement of the fading of fuse case to identify the color of the fuses and the sunglasses that the person in charge of attaching the towline to the tow hook was wearing.<br>Regarding the fading of the colored fuse cases, it is somewhat likely that it had not been managed appropriately.<br>It is probable that incorrect mounting of the fuses having the probability to lead to the towline break; therefore, the appropriate management and the measures against it should have been implemented.<br>(3) Judgment of making an emergency landing method<br>Regarding the captain's decision of right-turn landing to the north side, it is probable that he judged that the glider had a high performance thus if he had made straight landing, it is somewhat likely that the glider would have collided with the winch even if he had used |

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| | the air breaks.<br>(4) The altitude descent during the turning<br>Regarding the glider having greatly had descended its altitude during the turning for landing, the captain controlled it to prevent the altitude descent as possible as he could and he strongly intended to land on the targeted area because the turning was performed in insufficient altitude. Thus it is somewhat likely that the captain lost the balance in control during the turning; therefore, the side slip occurred and the altitude rapidly descended.<br>Moreover, it is somewhat likely that the down draft influenced the velocity lowering of the glider as well.<br>(5) The measures of the association against towline break in the low altitude<br>The measures against towline break that the association had taken before the occurrence of the accident were based on the verification outcome using the airframe with a lower glide ratio compared with the glider; therefore, it is somewhat likely that it was not effective to prevent this accident. Accordingly, it is hoped to take measures in accordance with the flight characteristics of gliders. |

# 4 PROBABLE CAUSES

In this accident, it is probable that the fuses on the towline of the glider broke during launching and the captain tried to turning landing; however, it crashed due to significantly descent of its altitude at low altitude.

Regarding the break of fuses, it is highly probable that the low intensity fuses were mounted incorrectly.

Regarding the significantly descent of altitude while the glider was circling, it is somewhat likely that the side slip was occurred due to operational unbalance caused by the circling under the insufficient altitude. Moreover, it is somewhat likely that the down draft contributed to the accident.

# 5 SAFETY ACTIONS

After this accident, the association newly established the preventive measures against incorrect installation and publicized it to all the members:

1 Connect the fuse case with the safety cable*4
2 Paint the single line and the fuse case in the same color
3 Confirm and read back the color of the fuse case by the captain and the person in charge of towline fitting
4 Mark the side of the airframe with the same color of the fuse case

Besides, in addition to the measures against the towline break which had been taken, the association newly prepared the pasture as the emergency landing area that was apart from the southwest of the gliding field for a measure against the towline break for high-performance glider. Moreover, the association recommends that when a towline-break occurs and the pilot determines that it is difficult to land in front of the winch, even if he or she fully extend the air breaks and it is too low altitude to make 360° turn to manage altitude, he or she go to the emergency landing area without hesitation.

*4 "safety cable" is an about 10 m long cable which connects towline extending from winch and fuselage. Fuses are installed between towline and single line.