

AI2019-8

**AIRCRAFT SERIOUS INCIDENT
INVESTIGATION REPORT**

**NON-PROFIT ORGANIZATION AERO SPORTS KITAMI
J A 4 0 2 7 & J A 2 2 8 8**

November 28, 2019



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 prevent future accidents and incidents. It is not the purpose of the investigation to apportion blame or liability.

TAKEDA Nobuo
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 SERIOUS INCIDENT INVESTIGATION REPORT



JA4027 (Aircraft A) and JA2288 (Aircraft B)

October 25, 2019

Adopted by the Japan Transport Safety Board

Chairman TAKEDA Nobuo
 Member MIYASHITA Toru
 Member KAKISHIMA Yoshiko
 Member MARUI Yuichi
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 Member NAKANISHI Miwa

Company	Non-Profit Organization Aero Sports KITAMI
Type, Registration	Aircraft A: Avions Pierre Robin DR400/180R, registered JA4027 Aircraft B: Alexander Schleicher ASK21, registered JA2288
Incident Class	Case of Unintended Drop of Tow Rope Article 166-4 (xv) of Ordinance for Enforcement of the Civil Aeronautics Act of Japan
Date and Time of the Occurrence	Around 13:45 JST (JST: UTC+9 hours; unless otherwise noted, all times are indicated in JST in this report on a 24-hour clock), on July 7, 2019.
Site of the Incident	Kitami City, Hokkaido Prefecture (43°46' N, 143° 46' E)

1. PROCESS AND PROGRESS OF THE AIRCRAFT SERIOUS INCIDENT INVESTIGATION

Summary of the Serious Incident	When Aircraft B was flying at an altitude of about 3,000 ft after taking off from Sky-port KITAMI (temporary airfield) towed by Aircraft A, a tow rope connecting both aircraft was fractured. Immediately thereafter, the tow rope that remained in Aircraft B dropped on the ground. There were no injury and damage to the aircraft and the ground.
Outline of the Serious Incident Investigation	The Japan Transport Safety Board designated an investigator-in-charge and one investigator on July 7, 2019 to investigate this serious incident. Comments were invited from parties relevant to the cause of this serious incident and the Relevant States.

2. FACTUAL INFORMATION

Aircraft Information	
Aircraft A (Airplane):	
Serial number: 1684	Date of manufacture: January 31, 1985
Certificate of airworthiness: No. TO-2019-069	Validity: June 15, 2020
Aircraft B (Glider):	
Serial number: 21046	Date of manufacture: January 30, 1981
Certificate of airworthiness: No. 2019-38-01	Validity: April 13, 2020
Maximum weight: 600 kg	Weight at the time of the serious incident: 465.1 kg

Personnel Information

Aircraft A: Captain Male, Age 52

Private pilot certificate (Aircraft: Single engine land)

March 8, 1995

Total flight time:

443 hours 32 minutes

Specific pilot competence:

Expiry of practicable period for flight: June 29, 2020

Class 2 aviation medical certificate

Validity: November 24, 2019

Aircraft B: Captain Male, Age 53

Private pilot certificate (Glider: High class)

December 1, 1988

Total flight time:

50 hours 31 minutes

Specific pilot competence:

Expiry of practicable period for flight: September 16, 2019

Class 2 aviation medical certificate

Validity: June 7, 2020

Meteorological Information

According to Japan Meteorological Agency data for Kitami City at 13:40 on the day of the serious incident : North wind at 2.2m/second, temperature 24.4 °C

Details of the Incident and Related Information

(1) History of the Flight

There was no abnormality found in Aircraft A, B and the tow rope by pre-flight check.

Aircraft A was towing Aircraft B up to a pressure altitude of 3,600 ft (3,000 ft AGL) near 3.5 km east of Sky-port KITAMI where a relatively strong ascending current was generated. The air flow was rough during the towing, and it did not seem that Aircraft B, the motion of which was unstable in vertical and lateral directions, was following right behind Aircraft A when the captain of Aircraft A sometimes checked it on a rearview mirror.

When Aircraft B was considerably uplifted by ascending current at a pressure altitude of about 3,000 ft and came close to Aircraft A like it was dashing at an increased speed, the tow rope was widely slacked downward. While the captain of Aircraft B was doing nothing to correct the slack line such as deceleration, the slack line was rapidly pulled accompanying a significant impact when pulled.

When the captain of Aircraft A looked at the rearview mirror to confirm what happened when he felt the impact, he recognized that the tow rope was broken because he could not see it, and commenced descending turn to the left in accordance with the procedures in case of the release. At the same time, he reported by radio the rope break and possibility that the tow rope remained in Aircraft B.

On the other hand, the captain of Aircraft B did not think of the rope break because he was not looking at the tow rope when the impact occurred although he felt a significant impact, and he instantaneously operated tow rope release lever (see Figure 2) feeling a danger that Aircraft B would be pulled in to Aircraft A because Aircraft A that he was watching attentively

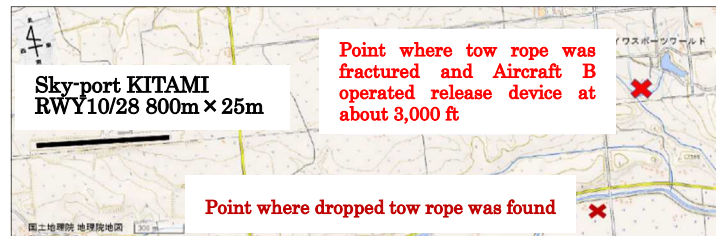


Figure 1: points where Aircraft B released tow rope and it was found



Figure 2: Tow rope release device of Aircraft B

made descending turn to the left. The captain of Aircraft B heard the report of the rope break from Aircraft A almost simultaneously with the tow rope release.

The dropped tow rope (about 49 m long and about 1.5 kg) was found in the field about 1 km south of the point Aircraft B operated the release lever.

(2) Fractured Tow Rope

The tow rope used was made of TETRON (polyester synthetic fiber) with 7 mm in diameter and about 52 m in overall length and met the strength specified in the flight manual.

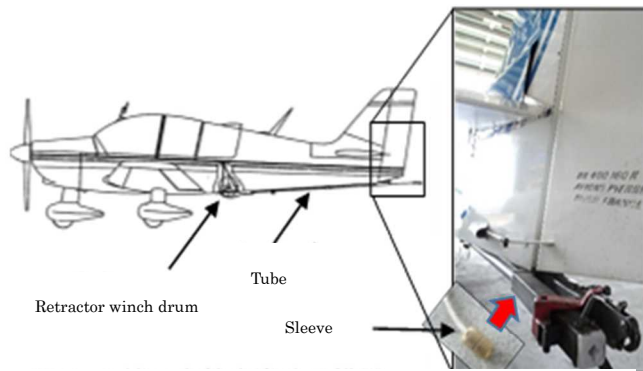


Figure 3: Tow rope retractor winch of Aircraft A



Figure 4: Fractured at a knot in the sleeve

Non-Profit Organization Aero Sports KITAMI replaced tow rope every 1,000 launches in accordance with the flight manual and the serious incident was 428th launch since the last replacement. The tow rope was fractured in a knot in the sleeve (see Figure 4) of tow rope retractor winch of Aircraft A (see Figure 3).

(3) Sleeve

The tow rope was knotted in the sleeve and had a mechanism that the sleeve moved backward in the tube and was blocked by stopper so that the tow rope could not be pulled out further from the aft end of Aircraft A. By this mechanism, pulling force imposed on the tow rope was not directly propagated to retractor winch drum in the lower part of Aircraft A (see Figure 3).

3. ANALYSIS

(1) Fractured Tow Rope

It is highly probable that the tow rope was rapidly stretched by a widened distance between Aircraft A and B from the widely slack condition, and was fractured at the knot in the sleeve by a strong tensile force exceeding pulling strength of the tow rope instantaneously applied after the sleeve had been blocked by the stopper.

(2) Coping by Aircraft B after Rope Break

It is highly probable that the captain of Aircraft B, who did not recognize the rope break although he felt the significant impact when the tow rope was fractured, judged that it was dangerous to be pulled in to Aircraft A by seeing it making descending turn to the left immediately, and accordingly operated the release lever, that caused the tow rope remaining in Aircraft B to drop on the ground against his will.

4. PROBABLE CAUSES

In this serious incident, it is highly probable that, when the tow rope was fractured while Aircraft A was towing Aircraft B, the captain of Aircraft B, who did not recognize the rope break and judged that it was dangerous to follow Aircraft A by seeing it making descending turn to the left, operated the tow rope release lever, that caused the tow rope remaining in Aircraft B to drop.

5. SAFETY ACTIONS

Main measures to prevent recurrence taken by Non-Profit Organization Aero Sports
KITAMI:

1. To disassemble a sleeve of tow rope retractor winch for checking its attached condition and the condition of a knot at daily checking.
2. To provide and reconfirm with members of the organization the acquaintance with the Skyport KITAMI including characteristics of conditions of the site and meteorological conditions, points to note when towing aircraft, and dealing measures with troubles.
3. To make it public that pilots of towing aircraft strive to grasp the flight experience and competence of individual members through communicating to their best with the members and take it into consideration for towing.