Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

Ozone Geo 6 Paraglider

Sugarloaf Hill, Co. Tipperary

5 March 2022

An Roinn Iompair
Department of Transport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

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[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.
[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.
[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents, on 5 March 2022, appointed John Owens as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	**Ozone Geo 6 Paraglider, Nil**
No. and Type of Engines:	**Nil**
Aircraft Serial Number:	**GN6S.W.27C.042 (Canopy Serial Number)**
Year of Manufacture:	**2021**
Date and Time (UTC)[4]:	**5 March 2022 @ 15:31 hrs**
Location:	**Sugarloaf Hill, Co. Tipperary, Ireland**
Type of Operation:	**Private**
Persons on Board:	**Crew – 1 Passengers – Nil**
Injuries:	**Crew – 1 (Serious)**
Nature of Damage:	**Nil**
Commander's Licence:	**Nil (None required)**
Commander's Age:	**37 years**
Commander's Flying Experience:	**Unknown**
Notification Source:	**Shannon Air Traffic Control (ATC)**
Information Source:	**AAIU Field Investigation**

[4] **UTC**: Co-ordinated Universal Time. All times in this report are quoted in UTC unless otherwise stated; local time was the same as UTC on the date of the accident.

SYNOPSIS

The Pilot unpacked the paraglider canopy on the north side of Sugarloaf Hill, Co. Tipperary. He allowed the wind to inflate the canopy and a take-off was performed. The Pilot flew briefly towards the north-east before performing a left turn through approximately 180°. The paraglider suddenly lost altitude as it continued to turn and the Pilot collided with terrain not far from the take-off point. The Pilot was seriously injured and was airlifted to hospital.

NOTIFICATION AND RESPONSE

The AAIU was notified of this occurrence by Shannon ATC at 22:10 hrs on the day of the accident. Two Inspectors of Air Accidents deployed to the scene early the following morning to commence an Investigation.

PREAMBLE

Paraglider Components

A paraglider consists of an inflatable canopy, which, when inflated by the airflow itself, has an aerofoil cross-section in the leading-to-trailing edge direction. An associated harness, which is worn by the pilot, usually contains a seat for use once airborne. An emergency reserve parachute is normally fitted to the harness, and a leg cover ('*cocoon*') may also be used. Several lines are permanently attached to the canopy (**Figure No. 1**); the lines come together on each side of the canopy and are attached to risers which are secured to the harness by the pilot using carabiners. The lines attached to the trailing edges of each side of the canopy are connected to handholds, known as '*brakes*' which the pilot uses to control the speed and (in addition to weight-shifting) the direction of the paraglider. The lines attached to the leading edges of the canopy are connected to a line which is operated by a foot-controlled '*speed bar*'. This is used to vary the canopy's geometry, thereby altering the speed of the paraglider.

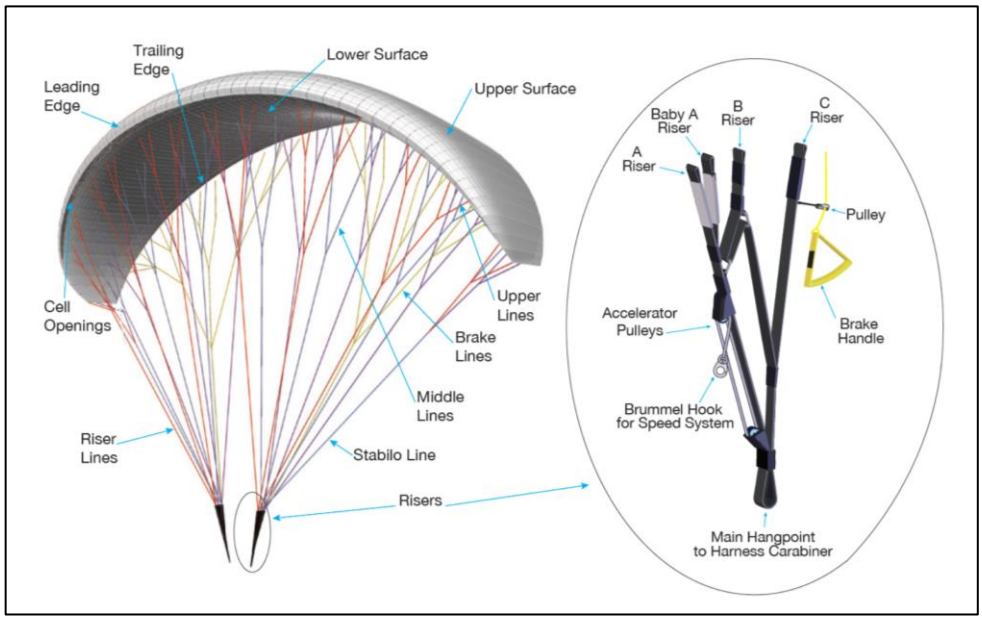

Figure No. 1: Paraglider Components (*adapted from Geo 6 Pilot's Manual*)

An electronic variometer (vario) with a built-in navigation satellite receiver can be used by the pilot to indicate and record position, direction of travel, and altitude. The vario visually and aurally indicates rate of climb/descent. In addition, a two-way radio can be used to communicate with other pilots in the vicinity.

Paraglider Launch Techniques

Paragliders are usually either forward launched or reverse launched.

In a forward launch, which is normally used in light winds, the pilot runs forward with the canopy behind. The pilot cannot see the canopy until it has inflated and risen overhead, and consequently, has limited time to check for correct canopy inflation and untangled risers.

In a reverse launch, which is normally used in stronger winds, the pilot faces the canopy and crosses the risers, before securing them to the harness and taking hold of the brakes. The pilot turns around under the canopy once it has risen overhead, and then runs to complete the launch. In a reverse launch, there is usually more time to inspect the canopy and risers during the launch because the pilot is initially facing the canopy.

1. FACTUAL INFORMATION

1.1 History of the Flight

The Pilot was using a vario (incorporating a navigation satellite receiver) and a helmet-mounted camera, both of which recorded the accident flight. The history of the flight is based on these recordings and on the Pilot's account of the accident.

The Pilot hiked up the north side of Sugarloaf Hill, Co. Tipperary, commencing from close to a monument known as Grub's Grave. He stated that he initially climbed to the top of the hill, but considered the winds to be gusting, so he walked approximately halfway back down the hill. The Pilot unpacked the canopy on the hillside. His back was to the wind and he was facing the canopy, which was laid out uphill from where he was standing, in preparation for a reverse launch. The Pilot placed his hands into the brake handholds, before moving backwards to allow the canopy to inflate and lift. The Pilot immediately lowered the canopy due to the some lines being tangled. He untangled the lines, before walking backwards down the hill to allow the canopy to inflate again. When the canopy inflated and lifted, the Pilot turned around underneath the canopy in an anti-clockwise direction (looking from above). The Pilot and canopy were now facing back down the hill (in an approximately northwards direction). The Pilot ran down the hillside to complete the launch.

Once airborne, the Pilot inserted his feet into the leg cover as he flew towards the north-east. He then removed his left hand from the left brake handhold and freed the foot operated speed bar line which had been caught under a pad that held his vario. He briefly returned his left hand to the handhold, removed his hand again and activated his vario. The paraglider appeared to be stable at this stage. The Pilot then returned his hand to the brake. He pulled the left brake and held it down, as the paraglider performed a left turn through approximately 180°. The paraglider suddenly lost altitude as it continued to turn through a further 180° approximately. The Pilot collided with terrain not far from where the take-off was performed approximately 30 seconds earlier.

1.2 Injuries to Persons

The Pilot sustained serious injuries and was airlifted to hospital by helicopter.

1.3 Damage to the Paraglider

The Investigation examined the paraglider wing, control lines, harness, and video from the Pilot's helmet camera with the assistance of subject matter experts. This did not identify any damage or defects that might have contributed to the accident.

1.4 Accident Location

The accident occurred at an elevation of approximately 500 metres (m) on the north side of Sugarloaf Hill, which is located in the Knockmealdown Mountains in County Tipperary, Ireland (**Figure No. 2**).

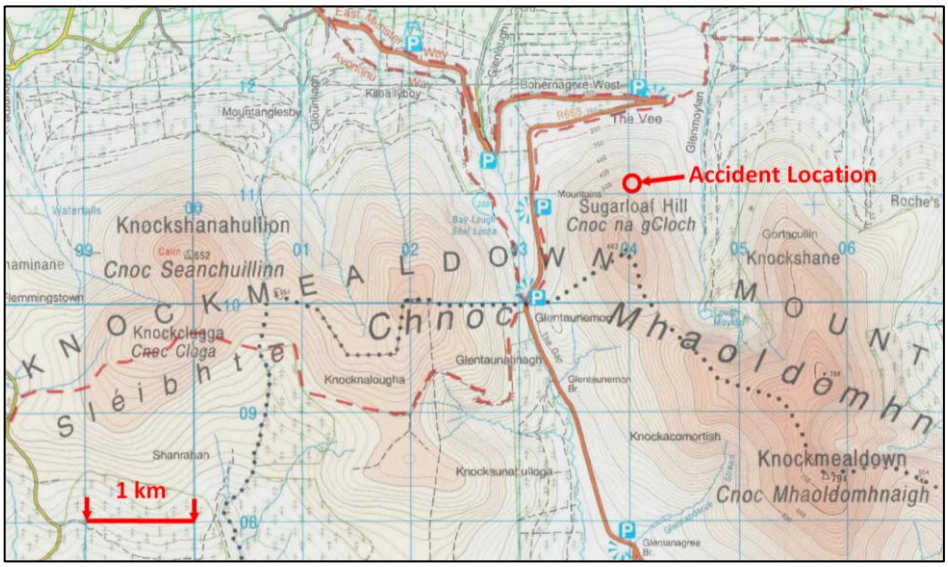

Figure No. 2: Accident location (*Ordnance Survey Ireland, Discovery Series No. 74*)

1.5 Interviews and Statements

1.5.1 Interviews with Pilot

The Pilot's first language was Spanish and therefore the Investigation sought the assistance of the Comisión de Investigación de Accidentes e Incidentes de Aviación Civil[5] (CIAIAC) in interviewing the Pilot.

The Pilot had arrived in Ireland approximately three weeks before the accident. He said that he had not flown in Ireland before and that he had never been to Sugarloaf Hill. He said that he used a mobile phone app that indicated locations from where he could fly. He also said that he did not tell anyone that he was planning to go flying. He noted that there were two other paragliders flying in the area at the time, but that he did not speak with the pilots as he did not know them.

[5] The Civil Aviation Accident and Incident Investigation Commission of Spain.

The Pilot said that prior to the flight he was apprehensive as he had not flown for six to eight weeks. He explained that he had previously flown several times each week in Spain and Portugal. He reported that the wind was strong and that everything happened very fast. However, he said he was used to flying in strong winds. He said he always performed a reverse launch, so he could see the canopy and check that everything was operating correctly. When describing this launch, the Pilot said he became airborne very quickly and that he was unable to check the lines properly.

The Investigation asked the Pilot about the left turn. He said he knew not to circle close to a hillside and was not sure what happened but thought that the canopy could have pulled him. He noted that the canopy then stalled and he fell. The Pilot did not use a two-way radio during the flight.

Regarding the canopy itself, the Pilot said he had several canopies. He said he used this canopy because it was more convenient for travel and he had used it several times before. He said his weight was 70 kilograms (kg) and the weight of the harness was about 2.5 kg. He did not think that weight was an issue and believed the canopy to be a very safe one.

1.6 Witness Information

The Investigation received statements from two paraglider pilots who were flying near Sugarloaf Hill at the time of the accident. The pilots reported that they were not expecting anyone to join them during that flight. At approximately 15:30 hrs, one of the pilots noticed a blue canopy in the air at Sugarloaf Hill and that it '*turned to the east and then it seemed to spin or turn quickly and it dropped to the ground*', and that it did not seem to be too high above ground when this occurred. The witness pilot attempted to make contact over the radio but there was no answer (the accident Pilot was not using a radio).

The witness pilot landed and was met by a friend in a car, and used binoculars to look at Sugarloaf Hill. The witness pilot saw a canopy on the ground, close to a track going up the hill. The witness pilot was driven to the start of the track and together with the car driver hiked back up the hill, while making contact with the emergency services by telephone.

The witness pilot stated that the accident site was located at approximately 16:15 hrs and that the accident Pilot had already telephoned the emergency services. The witness pilot was able to provide an update to the emergency services. The witness pilot disconnected the paraglider canopy from the harness and used the canopy to protect the accident Pilot from the cold. Regular updates regarding the accident Pilot's condition were provided to the emergency services until a search and rescue helicopter arrived. The pilot who had been flying with the witness pilot arrived at the same time as the helicopter and rendered assistance.

1.7 Personnel Information

The Pilot said he did not know how many hours total flying experience he had, but noted that he had flown 125 flights in the past year and had been flying since 2016. He had no formal paragliding qualifications/ratings (such qualifications/ratings are not required in Ireland – see **Section 1.11**).

1.8 Paraglider Information

The blue and white-coloured paraglider canopy was an EN[6] Class-B Geo 6 Size S (small), which was manufactured by Ozone. The projected area of the canopy was 20.3 square metres (m^2) and it weighed 3.49 kg. The canopy's certified flying weight was 65-85 kg. Its conformity check was dated 25 October 2021. A periodic inspection was due every two years or 100 hours flying time.

1.9 Recorded Data

A variometer (vario) was attached to a pad fitted to the Pilot's harness. The video recorded by the Pilot's helmet camera showed the vario being activated by the Pilot just after take-off. Position and time data from the vario was successfully downloaded by the Investigation. This indicated that the vario was activated at 15:31:05 hrs. The data from the vario and the video recording indicated that after take-off, the paraglider flew in a north-easterly direction for a number of seconds before a left turn commenced. The turn continued for more than 180° and lasted approximately nine seconds. The accident occurred approximately five seconds later, at 15:31:30 hrs, which was approximately 30 seconds after take-off.

1.10 Meteorological Information

Met Éireann, the Irish meteorological service, was asked to provide details of the weather conditions prevailing in the area of Sugarloaf Hill around the time of the occurrence. The information received is contained in **Table No. 1**.

Meteorological Situation:	High pressure of 1033 hPa (hectopascals) centred to the north-west of Ireland generates a mostly moderate north-easterly or variable airflow.
Surface Wind: **Wind at 2,000 ft:** **Between Surface and 300 ft:**	North-east, 5-10 knots (kt). North-east to east, 10-15 kt. North-east, 5-10 kt.
Visibility:	30 kilometres (km).
Weather:	Dry and sunny.
Cloud:	Few (1-2/8^{ths}) fair weather cumulus clouds with bases between 2,000-4,500 ft.
Temperature/Dew Point:	Surface: 8/-2 degrees Celsius. 1/-4 degrees Celsius at 2,000 ft.
Mean Sea Level (MSL) Pressure:	1032 hPa.
Freezing Level:	2,500 ft.

Table No. 1: Estimated weather conditions in the Sugarloaf Hill area at time of occurrence

One of the other pilots flying in the area at the time of the occurrence estimated the wind speed to be '*9-10 miles per hour*' (approximately 8 kt).

[6] **EN:** European Norm (EN) paraglider certification is a system whereby paraglider canopies are certified in one of four classes – A, B, C, or D, with 'A' being beginner-friendly and 'D' being intended for highly skilled pilots.

1.11 Legislation and Guidance Material

1.11.1 Irish Aviation Authority

Annex I of Regulation (EU) 2018/1139 on the common rules in the field of civil aviation (the '*Basic Regulation*') describes the categories of aircraft that are exempt from the requirements of the Regulation. These categories of aircraft are required to comply with national (Irish Aviation Authority – IAA) regulations. One of the categories includes aircraft that have a maximum empty mass, including fuel, of no more than 70 kg.

The IAA's Operations Advisory Memorandum, OAM 11, Revision 00, dated 3 October 2017, which predates Regulation (EU) 2018/1139, relates to '*Hang-Gliding and Paragliding in Ireland* […]'. It states the following:

> '*Hang-gliders or paragliders flown in Ireland as private aircraft (i.e. "private aircraft" means an aircraft which is neither a public transport aircraft nor an aerial work aircraft), which have a maximum empty mass of 80 kilograms or less, are exempt from the following requirements:*
>
> - *Aircraft Registration,*
> - *A Certificate of Airworthiness or a Flight Permit,*
> - *A Pilot Licence*'.

It further states that '*Hang-gliders and paragliders are not exempt from the rules of the air*'.

1.11.2 Irish Hang Gliding and Paragliding Association

1.11.2.1 General

OAM 11 refers to the Irish Hang Gliding and Paragliding Association (IHPA). The IHPA is an association of hang gliding and paragliding pilots in Ireland, whose stated purpose is to promote and guide the development of the sport in Ireland. The IHPA encourages visiting pilots to take out (free) visiting pilot membership. Pilot rating schemes are used in many countries to facilitate safe flying through structured learning based on progressive flying tasks and theoretical knowledge. The IHPA operates such a scheme and encourages all pilots to hold a rating. Ratings are required to participate in international hang gliding and paragliding competitions.

1.11.2.2 Flight Preparation and Personal Safety

The IHPA website includes a '*Flight Safety*' section which contains the following in relation to informing others when planning a flight:

> '*Whether you are simply ridge soaring alone or with friends, or planning to fly XC* [cross-country]*, make sure that someone you trust knows where you are at all times who can raise the alarm if you don't return home as expected*'.

2. AAIU COMMENT

The video recorded by the Pilot's helmet camera indicated that the paraglider was stable after-take-off and visual examination of the canopy and harness conducted after the occurrence did not identify any defects that would have contributed to the accident.

The Pilot advised the Investigation that his weight was 70 kg and his harness weighed 2.5 kg. The weight of the canopy was approximately 3.5 kg. Therefore, the total weight of the paraglider and Pilot was 76 kg. The canopy's certified flying weight was 65-85 kg. Consequently, the Investigation considers that weight was not a factor in the occurrence.

The meteorological aftercast indicated winds in the region of 10 kt. This is consistent with the estimate received from one of the other pilots flying in the area at the time of the accident. The aftercast indicated that the winds were from the north-east, which is consistent with the wind direction apparent in the video from the Pilot's helmet camera; this would have resulted in a headwind after take-off.

Following a take-off into wind, the Pilot performed a left turn through approximately 180^{o}, which resulted in the paraglider flying towards rising terrain. The turn would have also resulted in the wind experienced by the paraglider changing from a headwind to a tailwind. Furthermore, the surface relief of the area close to the accident location was complex (**Figure No. 2**), which could have resulted in varying wind conditions across the hillside and also at different heights above the hillside. It is possible that as the turn continued, adverse wind conditions caused the wing to collapse or stall. This would have resulted in the rapid loss of altitude evident in the video recording. The paraglider's height above ground was insufficient to permit a recovery attempt.

The Pilot was flying alone in an unfamiliar area and was not using a two-way radio. He reported that the wind was strong and that he was apprehensive prior to the flight as he hadn't flown in the previous six to eight weeks. The Pilot was seriously injured in the accident but was able to telephone the emergency services. However, this will not always be possible. In this case, the Pilot's canopy was noticed by chance by another paraglider pilot who was flying in the area. Had it not been possible for the Pilot to call the emergency services, or if the canopy had not been noticed by another pilot, the outcome of the accident may have been more severe. The importance of ensuring that details of a planned flight are made known to a third party cannot be overstated.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

Produced by the Air Accident Investigation Unit

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