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INVESTIGATION REPORT

Accident to the FLIGHT DESIGN - CTSW identified 83AGL

on 6 August 2020
at Cruis (Alpes-de-Haute-Provence)

Time	Around 11:30[1]
Operator	Private
Type of flight	Cross-country
Persons on board	Pilot and one passenger
Consequences and damage	Pilot and passenger fatally injured, microlight destroyed

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in August 2021. As accurate as the translation may be, the original text in French is the work of reference.

[1] Except where otherwise indicated, the times in this report are in local time.

Go-around during landing, loss of control, collision with the ground, fire

1 - HISTORY OF THE FLIGHT

Note: the following information is principally based on statements and data from the passenger's camera.

The pilot, accompanied by one passenger, took off from Fréjus microlight strip (Var) at 10:48 bound for Cruis Mas des Grailles microlight strip[2].

[2] 17/35, 300 m x 15 m grass runway, 6% slope beyond threshold 35.

At around 11:30, the pilot carried out a reconnaissance of the destination area flying over the facilities, before joining the downwind leg for runway 35.

During final, the pilot varied the engine's speed several times between 1,800 and 4,400 rpm up to touchdown, which occurred at the chevrons just after the runway threshold. At touchdown, the microlight had an indicated speed of 75 km/h, the flaps were in the 30° position and the attitude was approximately 10° nose-up.

In the second that followed touchdown, the pilot moved the throttle lever to "*full*" and immediately took off again. The engine speed increased to approximately 5,200 rpm, but the indicated airspeed rapidly decreased to 45 km/h approximately 15 seconds after touchdown.

The pilot then operated the flap control and the flaps retracted to configuration 0°, whilst the attitude was 17°.

In the three seconds that followed, the pilot lost control of the microlight, the passenger pulled on the stick and the throttle lever was moved to "idle".

The microlight collided with the ground and a fire broke out in the seconds that followed.

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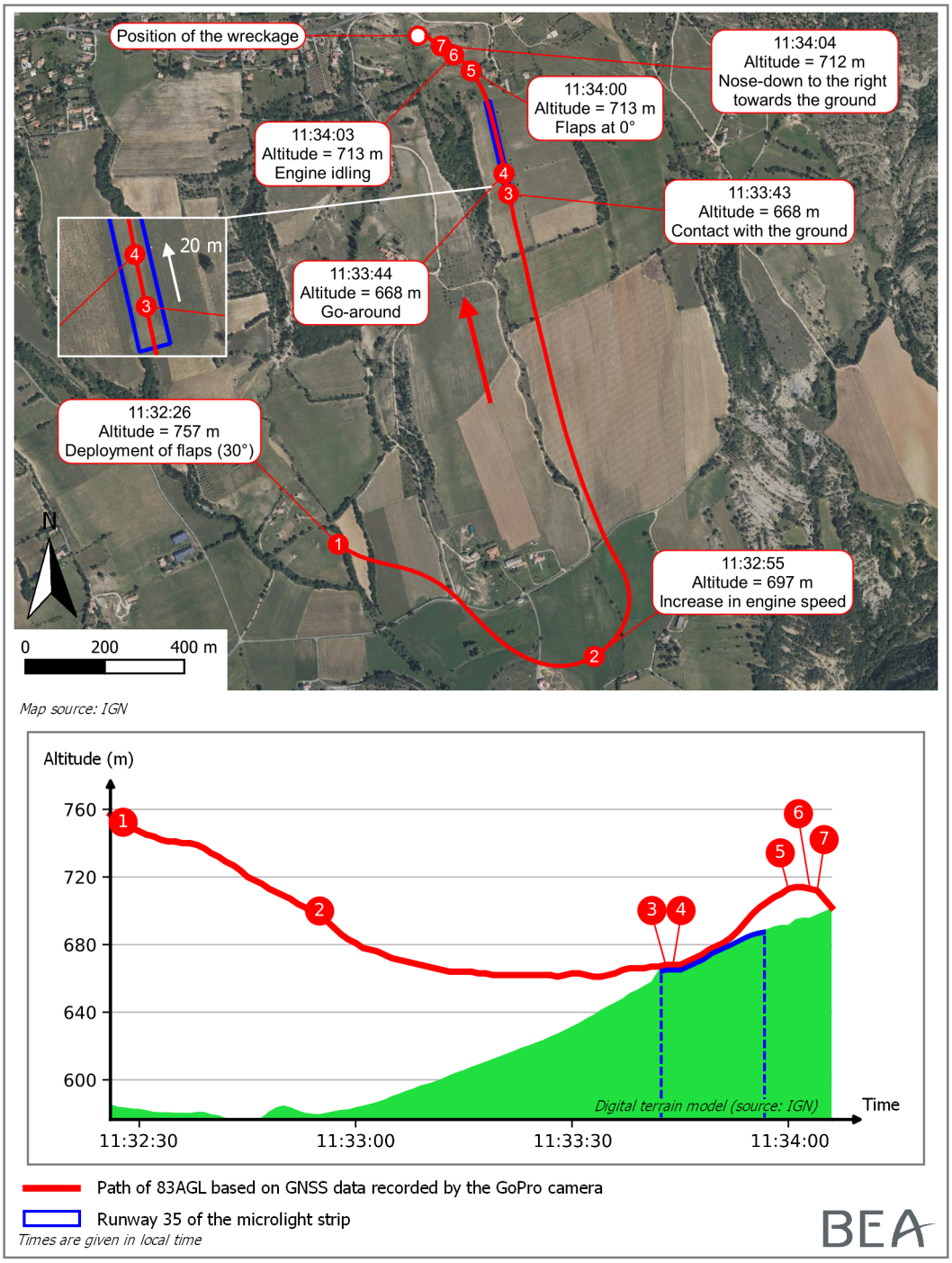


Figure 1: Path of end of flight

2 - ADDITIONAL INFORMATION

2.1 Microlight strip information

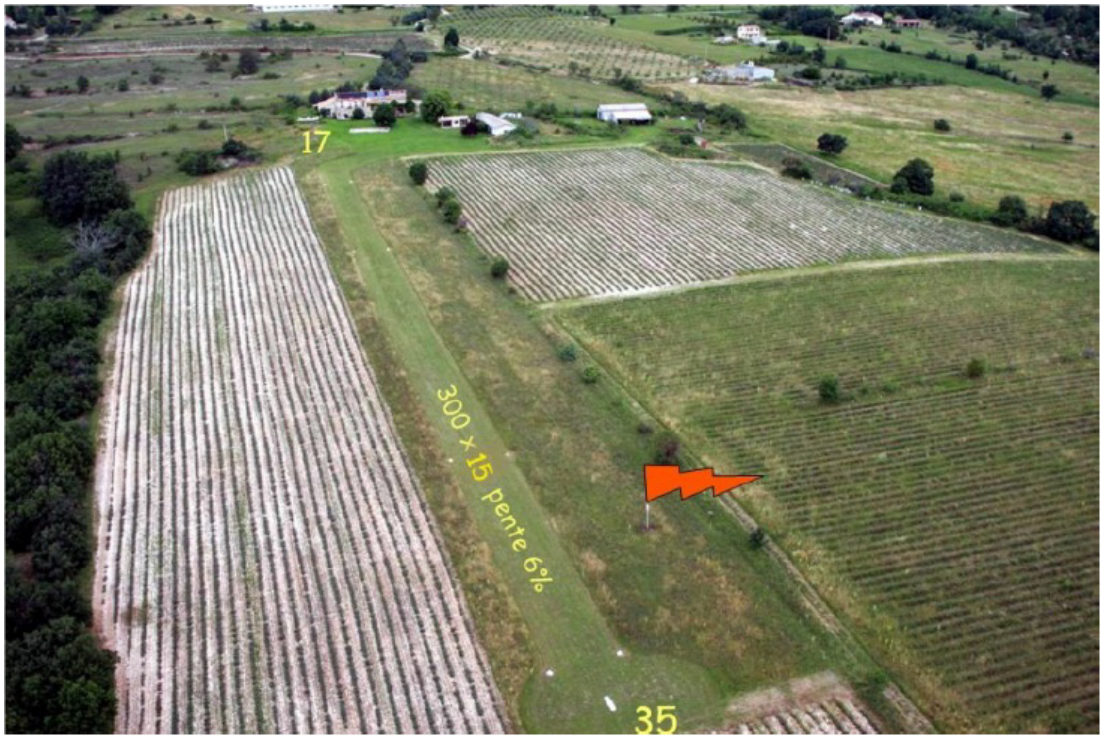
Cruis Mas des Grailles strip is a private microlight base comparable to a mountain airstrip[3]. It is located at an altitude of 690 m and has a 300 m-long grass runway oriented on 17/35. Landing must take place on runway 35, which has a +6 % slope.

[3] Although the strip does not strictly correspond to the definition of a mountain airstrip (refer to AIP AD 1.3-3 Index of mountain airfields and mountain airstrips), it is declared as such on the BASULM sheet.

The main building at Mas des Grailles is located approximately 25 m from threshold 17, close to a group of trees approximately five metres in height and in the direct extension of the runway.

The BASULM sheet specifies that strong downdrafts are frequent in summer and reminds pilots that they must contact the owner before any flight bound for the strip to obtain the owner's authorisation and instructions.

The owner stated that he requires this prior contact in particular to ensure that pilots are fully aware of the characteristics of the area. He confirmed that the passenger on board 83AGL had called him the day before the flight. He added that the passenger had already used the strip on several other occasions and was therefore familiar with landing on this sloping surface. The investigation was unable to determine how much the pilot knew about the characteristics of this runway, but the strip owner cannot remember him having landed there before.



Source: BASULM Sheet

Figure 2: Annoted view of strip

2.2 Pilot and passenger information

The 51-year-old pilot held a microlight pilot licence with the fixed wing (class 3) rating and passenger carrying privileges, issued in April 2008.

His flight experience could not be determined but several statements seemed to indicate that he flew regularly. According to the French Microlight Federation (FFPLUM), the pilot did not complete the mountain flight training course delivered by the Pôle National Vol Montagne (French School of Mountain Flying).

The 75-year-old passenger in the right seat was also a pilot. He held a Private Pilot Licence - Aeroplanes (PPL(A)) issued in 1995 and a microlight pilot licence with the fixed wing rating issued in 1997. He also held a valid microlight instructor rating.

He had logged more than 700 aeroplane flight hours. It was not possible to determine the total number of flight hours he had logged in a microlight or his recent experience.

2.3 Meteorological information

The meteorological conditions estimated by Météo-France at 11:45 were as follows:

- ❒ southerly wind of 3 kt with gusts up to 8 kt;
- ❒ CAVOK;
- ❒ QNH 1,017 hPa.

The temperature recorded at a station located approximately 12 km from the microlight strip was 28 °C.

According to Météo-France, the situation was not conducive to downdrafts at the end of the morning at the accident site.

2.4 Microlight information[4]

CTSW is a fixed-wing microlight made of composite materials with an unbraced upper wing, equipped with a ROTAX 912 ULSFR engine and an emergency ballistic parachute system.

The flaps are controlled by a multi-position selector in the cockpit and can be deployed to an angle ranging from -12° to +38°. Their position is indicated on the instrument panel. The recommended position for landing is between +15° and +38°.

The stall speeds at the maximum weight indicated in the flight manual are as follows:

- ❒ 85 km/h with the flaps in the -12° position;
- ❒ 75 km/h with the flaps in configuration 0°;
- ❒ 64.9 km/h with the flaps in the +38° position.

The microlight is not equipped with a stall warning system.

The take-off distance specified in the flight manual, at maximum weight, in standard atmosphere conditions and at sea level is 180 m up to flight through 50 ft. The recommended engine speed for take-off is between 4,400 rpm and 5,000 rpm, with the flaps in the +15° position, and a rotation speed of 75 km/h.

[4] All information is taken from issue No. 5 of the French user manual published in 2008.

2.5 Examination of site and wreckage

The wreckage was found approximately 250 m beyond the north end of the runway (threshold 17). Its structure was completely burned during the fire that broke out as a result of the accident.

Examination of the site revealed that the microlight was intact when it reached the ground, with a low horizontal speed. It had probably touched down with a nose-down attitude and at a right bank angle.

The flight control linkages were examined. No discontinuity was observed outside of the zones destroyed by the fire. All breakages observed on the links located outside of the areas destroyed by the fire had been caused by overload due to impact forces.

The engine was operating at the time of the impact and was supplying power to the propeller.

The emergency ballistic parachute system had been triggered. A witness who had approached the accident site just after the collision with the ground heard a bang and saw a projectile fly off. This information is consistent with the ignition of the ballistic parachute system which had likely been triggered by the fire.

A GoPro type camera was installed in the cabin. The camera was found and used by the BEA.

2.6 Read-out of recorded data

The passenger in the right seat held the camera in his hand and the angle of view showed most of the instruments on the instrument panel during the minutes leading up to the accident. In particular, the indicated airspeed, the engine speed, the attitude, the position of the flaps and the vertical speed were noted in several shots.

The camera recorded the associated GNSS data for each image. This data was used to reconstruct the flight path of the microlight before it collided with the ground (see Figure 1).

This path shows that, during final, the approach path was not stabilised. In addition, significant variations in engine speed were recorded during the final approach up to the moment the wheels touched down.

The study of the data pertaining to the take-off from Fréjus was used to estimate the climb slope at take-off under the day's conditions on a non-restrictive, flat surface runway, at approximately 7%, with the flaps in the 15° position.

2.7 Survivability

The violence of the impact and the fire which ensued left no possibility for the microlight's occupants to survive the accident.

2.8 Similar occurrence

On 27 May 2021, a similar accident involving the Evektor Eurostar identified 83AVO occurred at the Cruis Mas des Grailles microlight strip. This accident, during which both persons on board were injured, was not investigated by the BEA[5] but information relating to the accident was still gathered.

[5] In compliance with European Regulation No 996/2010, the BEA is not obliged to investigate microlight accidents. Its procedures stipulate that it only conducts a safety investigation in the event of fatal microlight accidents.

This information shows that:

- The pilot of 83AVO, who had extensive experience on many types of aircraft and of mountain flying, was familiar with the strip. He stated that he had arrived above the area at the end of the morning, a period during which aerological phenomena frequently start to cause tailwind on runway 35.
- The pilot recalled that engine assistance had been required for the final due to these aerological phenomena and that touchdown on the runway had not taken place in good conditions. The microlight had swerved to the left and the pilot had immediately initiated a go-around, by instinct. He had little memory of what had happened after this, but he stated that he had probably not managed to maintain sufficient speed whilst adopting a climb slope in order to avoid the obstacles at the end of the runway. According to the pilot, this had very likely caused the stall, possibly after a gust of wind, following which the microlight had collided with the ground.
- The pilot said that he had had a false sense of safety due to the configuration of the area and the "*gentle*" runway slope. Indeed, despite being familiar with the strip, he noted that during the reconnaissance overflight, he had had the impression of being over a lowland aerodrome and not a mountain airstrip and had not therefore been mentally prepared.

3 - CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

The pilot carried out an approach to a microlight strip where he was probably landing for the first time. In the presence of a tailwind component, he encountered difficulties stabilising on final.

The wheels touched down at the chevrons, which is the aiming point indicated on the strip chart, with the flaps in the landing configuration and a speed consistent with that recommended in the flight manual. Due probably to abnormal contact with the runway, the pilot decided to take off again despite the runway's slope.

During this take-off, the flaps initially remained extended in the landing configuration. The pilot did not have the power necessary to both maintain the speed and adopt a sufficient climb slope.

The microlight therefore flew at low speed and with a high angle of attack, with the engine delivering maximum power, which is a typical backside of the power curve situation. The pilot retracted the flaps, probably to attempt to increase his speed, and the microlight stalled at a height of around 12 metres. The pilot was unable to regain control of the path before the collision with the ground.

Contributing factors

The pilot's lack of training in mountain flying, and more specifically landing on sloping surfaces, may have contributed to his inappropriate decision to take off again.

The relatively non-mountainous environment around the microlight strip may cause some pilots to underestimate the potential hazards associated with the slope of the runway and the presence of obstacles.

Actions taken following the accident

The microlight strip chart was updated and now includes wording prohibiting the practice of a go-around beyond a certain ground marker.

Safety lessons

The accident to 83AGL is comparable with other events, such as the accident to 83AVO mentioned above, or the accident to the B&F Technik FK14 "*Polaris*" registered OO-E72 on 6 April 2017 at Megève (Haute Savoie), which was the subject of a BEA investigation report[(6)].

This report notably indicates best practices associated with the use of mountain airfields, and training on this topic provided by the FFPLUM and the PNVM. In particular, it states that go-arounds at mountain airfields or mountain airstrips, beyond a certain point (point of no return), are strongly advised against. The pilot must determine the point of no return and be aware that, beyond this point, go-arounds cannot be performed safely. Given in particular, the slope of the landing runway, the vegetation bordering the runway and the surrounding terrain, the aircraft's climb performance is generally not sufficient to clear the obstacles and follow a clear path.

[(6)] https://www.bea.aero/les-enquetes/evenements-notifies/detail/accident-de-lulm-fk14-polaris-immatricule-oo-e72-survenu-le-06-04-2017-a-megeve-74/