



**Accident** to the Autogyro Calidus  
identified **02AHO**  
on Saturday 30 September 2023  
at Mardeuil

<b>Time</b>	Around 17:10 <sup>1</sup>
<b>Operator</b>	Private
<b>Type of flight</b>	Local
<b>Persons on board</b>	Pilot and one passenger
<b>Consequences and damage</b>	Passenger fatally injured, pilot injured, gyroplane destroyed

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

## Collision with a power line during low-height flight

### 1 HISTORY OF THE FLIGHT

*Note: the following information is principally based on statements and data from the gyroplane's engine computer.*

At around 16:50, three gyroplanes and two fixed-wing microlights took off from Reims – Prunay aerodrome. The five aircraft, flying in an “extended formation”, headed south-west towards Château de Boursault<sup>2</sup>. The pilots left the aerodrome frequency to communicate on their own specific frequency. Once they had reached Château de Boursault, the five aircraft flew east towards Cumières. The pilot of 02AHO transmitted a radio message at this point indicating that he was leaving the group. A few minutes later, the gyroplane collided with a high-voltage power line crossing the Marne at a height of around 45 m.

As the pilots of the group had continued their cross-country flight, they only became aware of the disappearance of 02AHO after landing at Reims – Prunay.

### 2 ADDITIONAL INFORMATION

#### 2.1 Meteorological information

The weather conditions at the time of the occurrence at Reims – Prunay aerodrome situated 12 NM<sup>3</sup> from the accident site were a mean wind of 6 kt varying in direction between 20° and 110°. Visibility was greater than 10 km and the cloud base was higher than 7,800 m.

At the time of the accident, at 17:10, the azimuth of the sun was 240°.

<sup>1</sup> Except where otherwise indicated, the times in this report are in local time.

<sup>2</sup> Château de Boursault is situated 15 NM on 230° from Reims – Prunay aerodrome.

<sup>3</sup> The glossary of abbreviations and acronyms frequently used by the BEA can be found on its [web site](#).

## 2.2 Examination of site and wreckage

The gyroplane was lying in the middle of the Marne, at around 30 m from a high-voltage power line. One of the power line cables had been severed by the gyroplane's rotor.

The deformations in torsion of the gyroplane's rotor mast seemed to show that the rotor was turning at the time of the collision with the power line. The deformation of the tail boom indicated that the gyroplane probably turned over during its fall and that the tail was the first part to collide with the water. The examinations carried out did not find any fault in the flight controls. No additional examination of the power plant was carried out as the latter was functional at the time of the accident according to the pilot.

## 2.3 Engine computer analysis information

The gyroplane's Rotax 914 UL engine was equipped with a computer recording seven engine parameters<sup>4</sup> at a frequency of once a minute during the last twenty minutes of engine operation. More specifically, the computer recorded the maximum values reached each minute. With respect to the engine speed, the value was also recorded when the speed fell below 800 rpm. Lastly, the maximum value exceedance signals over the last two operating hours were also recorded. The computer did not record information concerning engine cycles<sup>5</sup>.

The analysis of the recorded data found that there had been no exceedance in the last two hours of engine operation. Likewise, during the last twenty minutes, all of the recorded parameters were nominal, with no engine speed below 800 rpm.

## 2.4 Pilot experience and statement

The 58-year-old pilot held a microlight pilot licence and a gyroplane class rating. He indicated that he had flown a total of approximately 350 flight hours of which 300 hours on the Calidus, including 5 hours in the 30 days preceding the accident.

According to the pilot, the flight was nominal until his passenger ceased replying to him. He explained that he then understood that the radio was no longer operating. He switched it back on and it started operating again. The pilot declared that after this first incident, the engine suddenly shut down and that he managed to restart it in flight by making an input on the starter.

However, the pilot was worried and left the formation to carry out a precautionary landing. At this point the gyroplane was north of the Marne, at a height of 870 ft and on an easterly heading. The pilot indicated that he flew a circle and identified two fields which seemed suitable for a precautionary landing (see **Figure** ). He mentioned that he headed to the first one situated south of the Marne. The pilot declared that on approaching the first field, he realised that it was not suitable for a precautionary landing because of a bank situated in the middle of it. He stopped descending at an altitude of around 500 ft, i.e. a height of around 150 ft and headed to the second field situated to the east of the first one. To do this, the pilot flew over the Marne staying at a height of around 150 ft and a speed of around 90 to 100 km/h. The second field was situated at the edge of the river, behind a group of trees. The pilot declared that aware that he was a little low, he had planned to gain altitude to pass over the group of trees and land. He explained that he deliberately

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<sup>4</sup> RPM; position of throttle lever, air pressure, manifold pressure, manifold temperature, position of turbo bleed valve, boost time.

<sup>5</sup> A cycle corresponds to an engine start-up and shut-down.

kept the speed at around 100 km/h in order to be able to carry out this manoeuvre. While flying overhead the Marne, the pilot only saw the power line crossing the river a few seconds before the collision. He tried to avoid it but without success.

The pilot added that the engine was operating normally at the time of the accident.

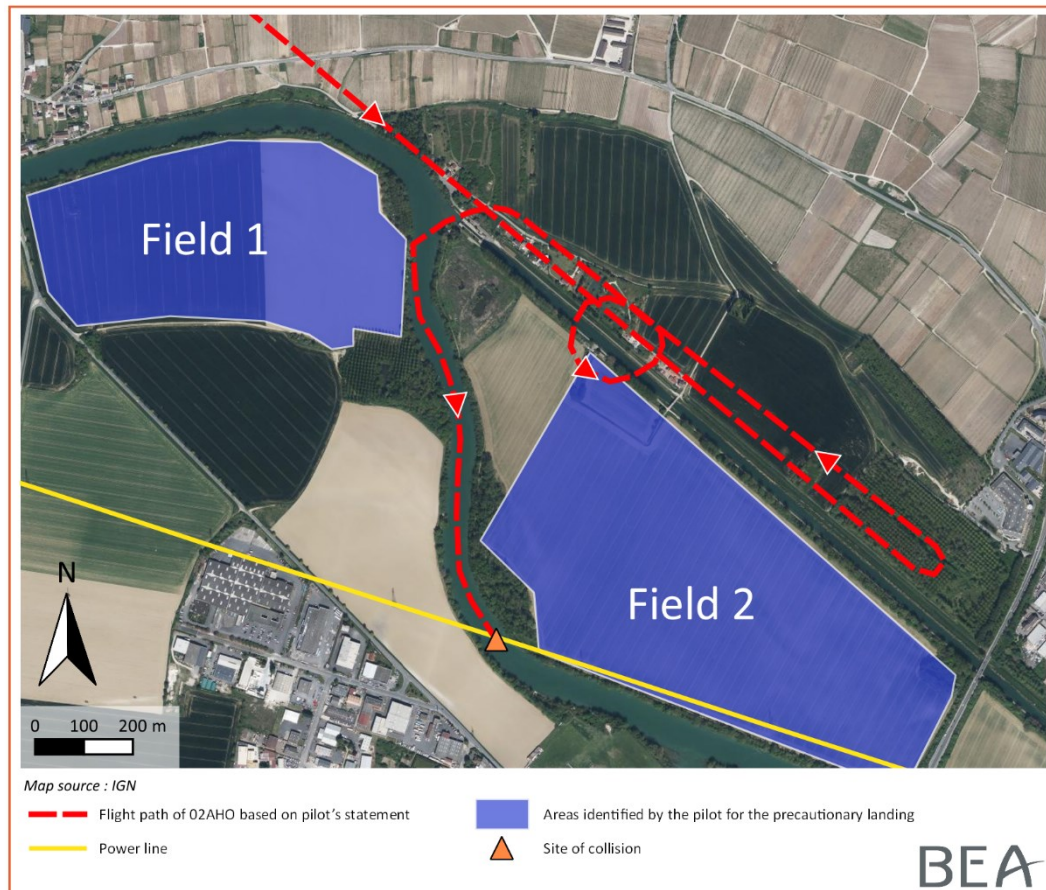


Figure 1: aerial view of accident site

## 2.5 Precautionary landing information

A precautionary landing can be envisaged in the case of a foreseeable failure of a component of the microlight.

For such a landing, it is advisable to carry out a high reconnaissance in order to get a general view of the environment, estimate the wind, the terrain and the surface conditions. This also enables the pilot to identify ground references, which will be useful for representing a runway circuit.

Once a terrain has been identified, a reconnaissance at low height must be carried out to confirm the information acquired during the first reconnaissance, and to estimate the dimensions of the terrain and identify obstacles<sup>6</sup>.

If the terrain is suitable, the pilot can then finalise the landing. It is recommended that the pilot hold a sufficient height and low speed to facilitate the control of the gyroplane's flight path.

<sup>6</sup> Based on information in the [Guide de l'instructeur VFR](#) published by the ENAC, 2021 3<sup>rd</sup> ed. and in the [Manuel du Pilote ULM](#), published by Cépadués, 2023 15<sup>th</sup> ed.

## 2.6 Safety harness information

The body of the passenger in the rear seat was found in the wreckage, with the harness fastened. Additional examinations carried out on the pilot's and passenger's harnesses found that the release system was functional. However, if traction is applied to the safety buckle and if a small amount of pressure is applied to the release button, the spring tab may not release the tongue.



Figure 2: view of rear passenger's fastening system (source: BEA)

## 3 CONCLUSIONS

*The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.*

### Scenario

The pilot of 02AHO indicated that he had experienced a problem leading to the radio switching off and then the engine shutting down while he was flying in a group with four other aircraft, namely two gyroplane and two fixed-wing microlights. He specified that after managing to restart the radio and the engine, he left the formation in order to carry out a precautionary landing.

A few minutes later, when the pilot was flying over the Marne at a low height, the microlight collided with a power line that the pilot had seen too late.

The investigation was not able to understand the reasons which led the pilot to fly 150 ft overhead the middle of the Marne, at high speed when he had doubts about the operation of the engine. Indeed, the flight path taken by the pilot was not such that a safe precautionary landing could be carried out.

Furthermore, the BEA was not able to confirm either the faults mentioned by the pilot or their correlations.

***The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.***