



Accident to the class 6 DYNALI H3 Sport
identified **45ARJ**
on Wednesday 20 September 2023
at Bazoches-les-Gallerandes

Time	17:02 ¹
Operator	Private
Type of flight	Local
Persons on board	Pilot and 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. As accurate as the translation may be, the original text in French is the work of reference.	

Collision with the ground during low-height flight

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on the MoTeC² computer data.

The pilot, accompanied by a passenger, took off from the private Helicopter Landing Site (HLS) at his home at around 17:00 and headed south-west (see **Figure 1**, point **①**). Around one minute later, the microlight reached a height of no more than 300 ft³ (point **②**) and then flew for around thirty seconds westwards. It then descended to a height of no more than 150 ft (point **③**) in a north-westerly direction with a ground speed of around 100 km/h. The microlight collided with the ground around forty seconds later (point **④**).

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

² The height values provided represent the maximum height reached by the microlight (see paragraph 2.5).

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

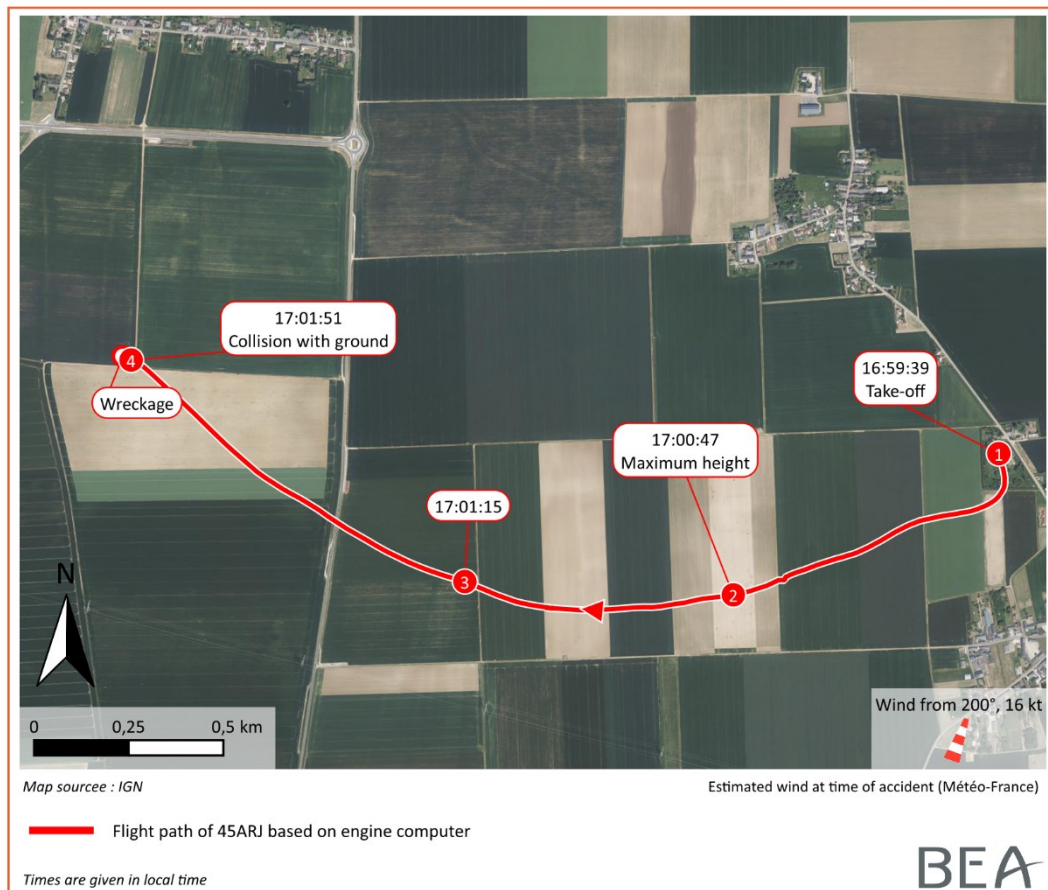


Figure 1: flight path of 45ARJ

2 ADDITIONAL INFORMATION

2.1 Meteorological information

The meteorological conditions were compatible with a VFR flight.

The Météo-France analysis indicated the presence of cumulus and stratocumulus at around 5,000 ft. The wind was from the south-south-west of around 30 km/h with gusts reaching 45 km/h.

2.2 Persons on board information

2.2.1 Pilot

The 78-year-old pilot obtained a microlight pilot license in:

- 1996 for the class 1 paramotor;
- 1996 for the class 3 fixed-wing;
- 2007 for the class 4 gyroplane;
- 2012 for the class 6 microlight helicopter.

He had been a fixed-wing microlight instructor since 2001 and a microlight helicopter instructor since 2012. He had logged more than 4,000 microlight flight hours, principally on fixed-wing microlights. According to a relative, he had flown less than a hundred hours on microlight helicopters including training hours and hours on 45ARJ.

The pilot obtained a helicopter Private Pilot Licence (PPL(H)) in 1973 and held a helicopter Commercial Pilot Licence (CPL(H)) obtained in 1979. He had also been a helicopter flight instructor since 1982 and examiner. He had logged more than 30,000 helicopter flight hours. At the date of the accident, he held type ratings for the AS350/EC130, Bell 206, EC120B, R44 and SA318/SE313.

The pilot held an aeroplane Private Pilot Licence (PPL(A)) obtained in 1966 and had logged more than 6,000 aeroplane flight hours.

The pilot had also been a helicopter pilot and instructor with the Aviation Légère de l'Armée de Terre (ALAT) (French army light aviation) between 1964 and 1979. He had totalled around 4,000 helicopter flight hours during this period. He had been trained in tactical flying and very low-level flying, which he could perform on certain missions.

The pilot held a valid class 1 medical certificate. The CPEMPN medical examiner described the pilot as being both physically and mentally alert. The autopsy carried out on the pilot did not reveal any element likely to have contributed to the accident.

2.2.2 Passenger

The 68-year-old passenger did not hold a pilot licence. He was a skydiver and, according to his wife, had made some 270 jumps, mainly from historic aircraft. She indicated that he had met the pilot in the course of this activity and that the latter had offered to take him for a “ride in a helicopter”.

2.3 Site and wreckage information

The microlight wreckage was found on a farmed plain, with no obstacles. It was situated at an altitude of 430 ft at 2.3 km from the HLS used for taking off. The area had few references (trees, woods for example) to enable the pilot to estimate the height at which he was flying over the ground.

The wreckage was complete, grouped together and lying on its RH side. It was oriented at 170°. The entire front section of the microlight was destroyed.

On the ground, two parallel trenches were identified next to the wreckage. In all likelihood, they were the result of the main rotor blades striking the ground when the microlight tipped over onto its RH side after pivoting.

The deformations and ruptures on the microlight chassis and on the forward part of the flight controls indicated a head-on compression. All the ruptures identified on the chassis, flight controls and main rotor blades were the result of a high-energy collision with the ground.

There were no engine ruptures and the engine rotated freely.

Observations of the blades and fragments of the canopy under UV light revealed no significant organic traces associated with a possible bird strike.

The analysis of the site and wreckage revealed that the microlight collided with the ground, with a nose-down attitude and high energy. There was no technical evidence to explain the accident.

2.4 45ARJ information

The Dynali H3 Sport is a class 6 microlight helicopter manufactured by the Belgian company, Dynali and equipped with a Dynali motors 912ULS-I-BB engine providing a maximum power of 135 hp. 45ARJ was equipped with dual controls. The microlight flight manual specifies that the pilot is sat in the LH seat, the pilot of 45ARJ was sat in the RH seat during the accident flight.

The microlight belonged to the company Rotor Maintenance, the latter was owned and managed by the pilot. The company had purchased the microlight in March 2023. The investigation was not able to determine the number of flight hours performed by the microlight but according to relatives, this was probably between 25 and 50 hours at the date of the accident. The pilot was the sole user of the microlight.

45ARJ had encountered a few issues since being put into service: governor instability, fraying of drive belt, damage linked to a hard landing by the pilot of the importer. All of the problems and damage had been corrected by Dynali.

The weight and balance at the time of the accident were within the envelope defined by the manufacturer.

2.5 Analysis of recorded data

45ARJ was equipped with:

- an EFIS computer on the instrument panel;
- an on-board electronic system (MoTeC computer) dedicated to the engine.

The EFIS was damaged, in particular the memory component. As a consequence, the recorded data could not be recovered.

The MoTeC computer records engine and flight data. The last 14 flights, including the accident flight, were recorded. They were not dated.

The analysis of the engine data, carried out jointly with the manufacturer, did not reveal any engine malfunction.

The “ambient pressure” parameter used to estimate the altitude, showed an inconsistency at the end of the accident flight: the values recorded just before the collision with the ground (point 4, in the immediate vicinity of the wreckage), at the time when the other parameters showed sudden variations, were not consistent with the altitude of the ground. The microlight manufacturer indicated that this inconsistency could be linked to the position of the pressure sensor situated behind the pilot’s seat in the microlight, in a low-pressure area. The measurements can also be affected by the speed of the microlight.

The BEA carried out a study based on the analysis of flights performed by other Dynali H3. When the parameters recorded by the MoTeC computer were compared with those of the EFIS, it showed that the altitude calculated using the “ambient pressure” parameter recorded by the MoTeC was overestimated with respect to the altitude recorded by the EFIS. However, the

correction function varied from one microlight to another. The manufacturer added that the pressure value could also be impacted according to the sideslip angle or by disturbances linked to the main rotor. The differences observed do not have an influence on the functions of the computer.

In the absence of EFIS data, the BEA was not able to determine a corrective formula for the altitude calculated using the ambient pressure, recorded in the MoTeC computer of 45ARJ. However, it was established that the altitude calculated using the recorded ambient pressure was higher than the actual altitude of 45ARJ.

The analysis of the estimated altitude for the accident flight showed that the flight was performed at low altitude, initially below 300 ft, then below 150 ft in the last 40 s of the flight. The analysis of the altitude data recorded by the MoTeC computer during previous flights showed that several sections of the flight path were flown at low height, below 100 ft.

2.6 Statements

Several relatives, helicopter pilots and/or microlight helicopter student pilots spoke to the BEA. Most had flown with the pilot on his microlight.

The statements revealed that:

- the pilot, whether instructor or pilot-in-command, systematically sat in the RH seat in the microlight;
- in the case of helicopter pilots, the pilot used to leave the controls of the microlight to his passengers: some as soon as they took off, others during cruise only, so that they could “get a feel of the aircraft”; in these conditions, the pilot kept his hands on the controls;
- four of the five helicopter pilots interviewed, who had flown as passengers in the microlight with the pilot, mentioned that they had flown at regulatory heights, while the fifth indicated that he had flown at low height (a few metres high), about a month before the accident;
- during helicopter flights, the pilot could be very demonstrative with his passengers. In particular, he could fly at low height. One of the witnesses mentioned having the “skids in the corn cobs”.

2.7 Deterioration of abilities with age

As a person ages, some of their abilities will deteriorate. Vision, hearing, proprioception and dexterity will progressively diminish, in ways that are specific to each individual. An older person will no longer be able to do what they were able to do when they were young. However, since the body will develop compensatory mechanisms to offset these deficiencies, the aging subject can remain “fooled” for a long time by the reality of this deterioration.

Aeronautical experience acquired over many years is likely to compensate for these physiological deficiencies partially and temporarily.

3 CONCLUSIONS

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

Scenario

The microlight collided with the ground during a low-height flight. The examination of the site and wreckage showed a practically head-on collision. The pilot, flying at low height, had disregarded the ground safety margins.

According to witnesses, this was a frequent personal practice for the pilot when flying a helicopter, and data from previous flights suggest that he also flew at low height with this microlight.

The investigation was not able to determine the reasons for the loss of control, or who was at the controls during this phase of the flight.

Flying at low height leaves little chance of recovering from an accidental situation, whatever the pilot's level of experience and dexterity, even when used to instruction.

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