



Accident between
the ROBIN DR400-140B registered **F-GLDN**
and
the ATEC 122 Zephyr identified **44APT**
on Friday 29 November 2024
at Lunéville - Croismare aerodrome

Time	Around 15:30 ¹
Operators	F-GLDN: Aéroclub de Lorraine 44APT: Private
Type of flight	F-GLDN: Revalidation 44APT: Local
Persons on board	F-GLDN: One instructor, one pilot and one passenger 44APT: One pilot and one passenger
Consequences and damage	F-GDLN: Aeroplane destroyed, pilot severely injured, instructor injured 44APT: Microlight substantially damaged

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 on final between an aeroplane and a microlight, collision of the aeroplane with the ground

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on the GNSS² computers of the two aircraft pilots, images from a security camera and statements.

The pilot of the DR400 took off from Lunéville - Croismare aerodrome at approximately 14:40 for a flight, the purpose of which was to revalidate his licence by experience. He was accompanied by an instructor and his son.

The pilot of the microlight, accompanied by one passenger, also took off from Lunéville aerodrome at approximately 14:50 for a local flight.

The pilot of the DR400 carried out a touch-and-go at Nancy - Essey airport and some handling exercises during the return leg to Lunéville. The pilot then joined the downwind leg for paved runway 09, performed the aerodrome circuit and went around on final as the runway was still

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

² The glossary of abbreviations and acronyms frequently used by the BEA can be found on its [web site](#).

occupied. The instructor then asked the pilot to climb to 3,000 ft to carry out a practice forced landing and transmitted the associated radio message (see Figure 2, point ①). For the occupants of the aeroplane, there was nobody in the circuit likely to interfere with their exercise.

The pilot of the microlight flew towards the south over a few points of interest and then returned to Lunéville. He flew over the aerodrome at an altitude of approximately 1,300 ft (see point ②) then joined the downwind leg for paved runway 09. The pilot indicated that he transmitted his radio messages, and in the absence of any response or other transmission, he thought he was alone in the circuit.

While the pilots of the two aircraft were on final for paved runway 09 (with the pilot of the microlight making a standard approach with a slope of around 3° and the pilot of the DR400 carrying out a practice forced landing with a steeper slope of around 7°), they collided in flight around 20 m above the ground and approximately 200 m from the runway threshold.

The video of a security camera showed that the DR400 stalled and collided with the ground in a field full of rubble located on the axis of the runway. The instructor and the pilot's son evacuated the aircraft with the help of the first responders who quickly arrived on site. The pilot was injured and was evacuated by the emergency services.

The pilot of the microlight heard a "loud noise" during the collision and noticed a total and instantaneous loss of engine power, which he associated with an "engine explosion". As the microlight was still manoeuvrable, he made a sidestep to land on the unpaved runway 09R, which he considered to be more appropriate. After landing, he towed the microlight to the hangar, where he met the members of the emergency services, who asked him where the other aeroplane was. He then realised that there had been a mid-air collision.

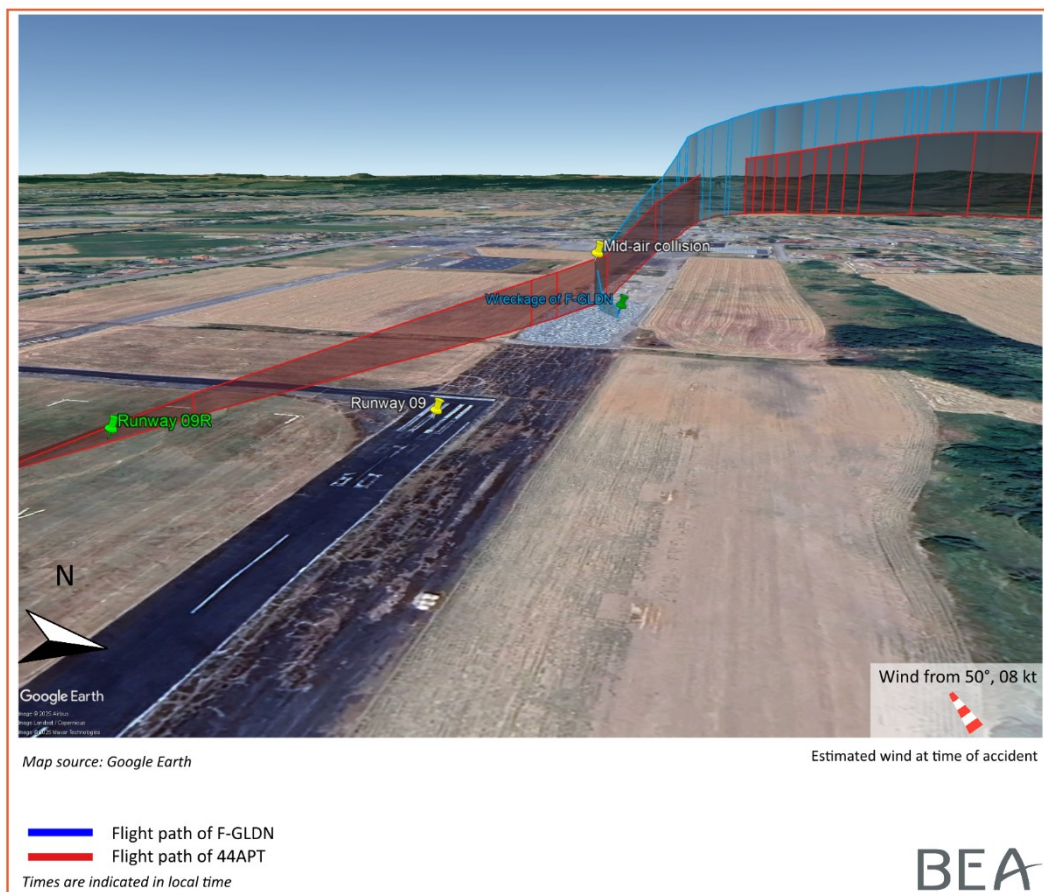


Figure 1: flight paths of the two aircraft during the mid-air collision

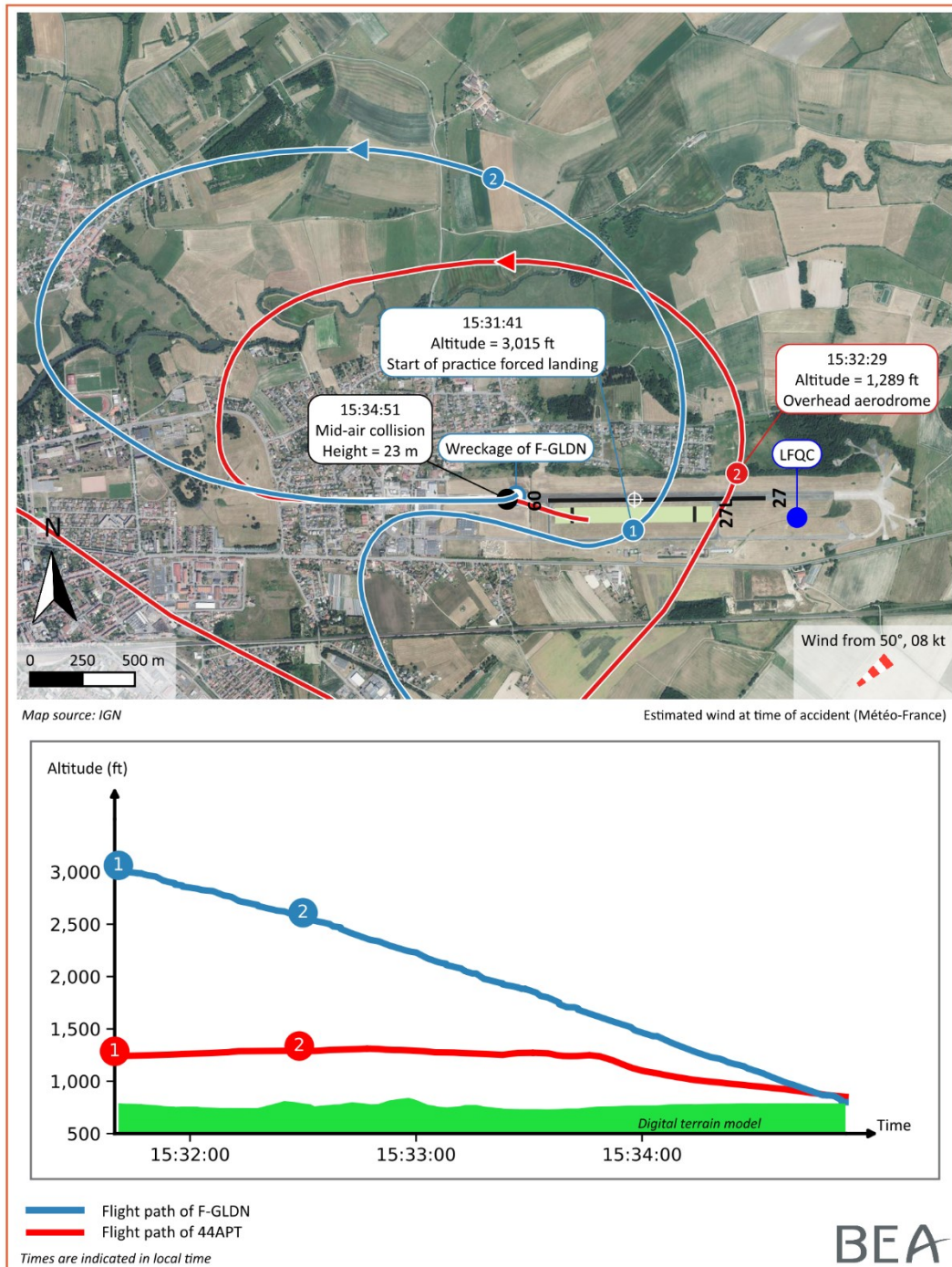


Figure 2: flight paths of the two aircraft

2 ADDITIONAL INFORMATION

2.1 Aerodrome information

Lunéville - Croismare aerodrome is an uncontrolled aerodrome. It does not have its own radio frequency³. The A/A frequency to be used is 123.500 MHz. This frequency is not recorded and is shared with other neighbouring aerodromes which also do not have an allocated frequency.

³ The aeronautical information does not specify that the aerodrome is limited to aircraft equipped with a radio.

The aerodrome has two parallel runways: one paved runway 09/27 measuring 1,040 m x 20 and one grass runway 09R/27L adjacent to the paved runway and measuring 750 m x 75.

The aerodrome circuit is standard, at an altitude of 1,800 ft (1,000 ft AAL) north of the runway.

2.2 Meteorological information

The METAR report at 15:30 for Nancy - Essey airport, located approximately 25 km from Lunéville aerodrome, indicated the following: 050° wind of 8 kt, CAVOK, temperature 7°C, QNH 1,029 hPa.

The meteorological conditions estimated by Météo-France at the time of the accident were substantially similar.

2.3 Aircraft and damage information

2.3.1 Atec Zephyr identified 44APT

After landing, the microlight was towed to the hangar, where the BEA carried out examinations the next day.

The engine cowling, part of the engine and the left wing showed marks of contact with the propeller of the DR400. The damage observed on the engine (severing of several electrical cables, of the ignition units, of an attaching point on the frame and of the fuel manifold on the left-hand side) explained the loss of power noticed immediately after the collision. Tyre marks and impact marks were also visible on the fuselage and on the whole of the second half of the left wing. The microlight's tailplane, canopy and landing gears were intact. The flight control linkages were examined and were operational.



Figure 3: general view of the microlight (Source: BEA)

The microlight is equipped with a GNSS navigation system.

Following visual checks on the electrical system, the microlight was powered up again with its battery still connected. The active radio frequency was set to 125.500 MHz, and the stand-by frequency⁴ was set to 120.700 MHz. Radio transmission and reception were tested on the ground over the area's A/A frequency (123.500 MHz). The radio was operating nominally.



Figure 4: radio of the microlight
(Source: BEA)

2.3.2 DR400-140 registered F-GLDN

The wreckage was lying on a pile of marble rubble located on the axis of the final for the paved runway, around 170 m before the threshold. The wreckage was complete and not dispersed. The extensive damage to the left wing (which was partially folded under the fuselage) and to the front of the aeroplane (which was lying vertically in the rubble) indicates a very probable nose-down attitude and a steep left bank angle when the aeroplane struck the ground.

Traces of paint were observed on the tread and left-hand sidewall of the front tyre. This damage, as well as part of the damage visible on the blades, was related to the collision with the microlight. The rest of the damage observed seemed to result exclusively from the impact with the ground.



Figure 5: site and wreckage of the DR400 (Source: Lunéville police services)

The aeroplane was equipped with a GNSS navigation system: Garmin GNS430. This system also records the last radio frequencies used:

- active COM frequency: 123.500 MHz – Lunéville - Croismare aerodrome (LFQC);
- stand-by COM frequency: 119.605 MHz – Nancy - Essey aerodrome (LFSN).

⁴ The radio frequency selection rotary switch changes the frequency to stand-by.

2.3.3 Estimated flight paths of the two aircraft at the time of the collision

The observations made on the microlight and on the wreckage of the aeroplane were consistent with a side collision between the two aircraft flying in a convergent direction towards the runway, with the DR400 located higher than and to the right of the microlight. The two aircraft did not suffer any major structural damage during the collision, which nevertheless caused the microlight's engine to stop and the aeroplane to lose control until it collided with the ground.

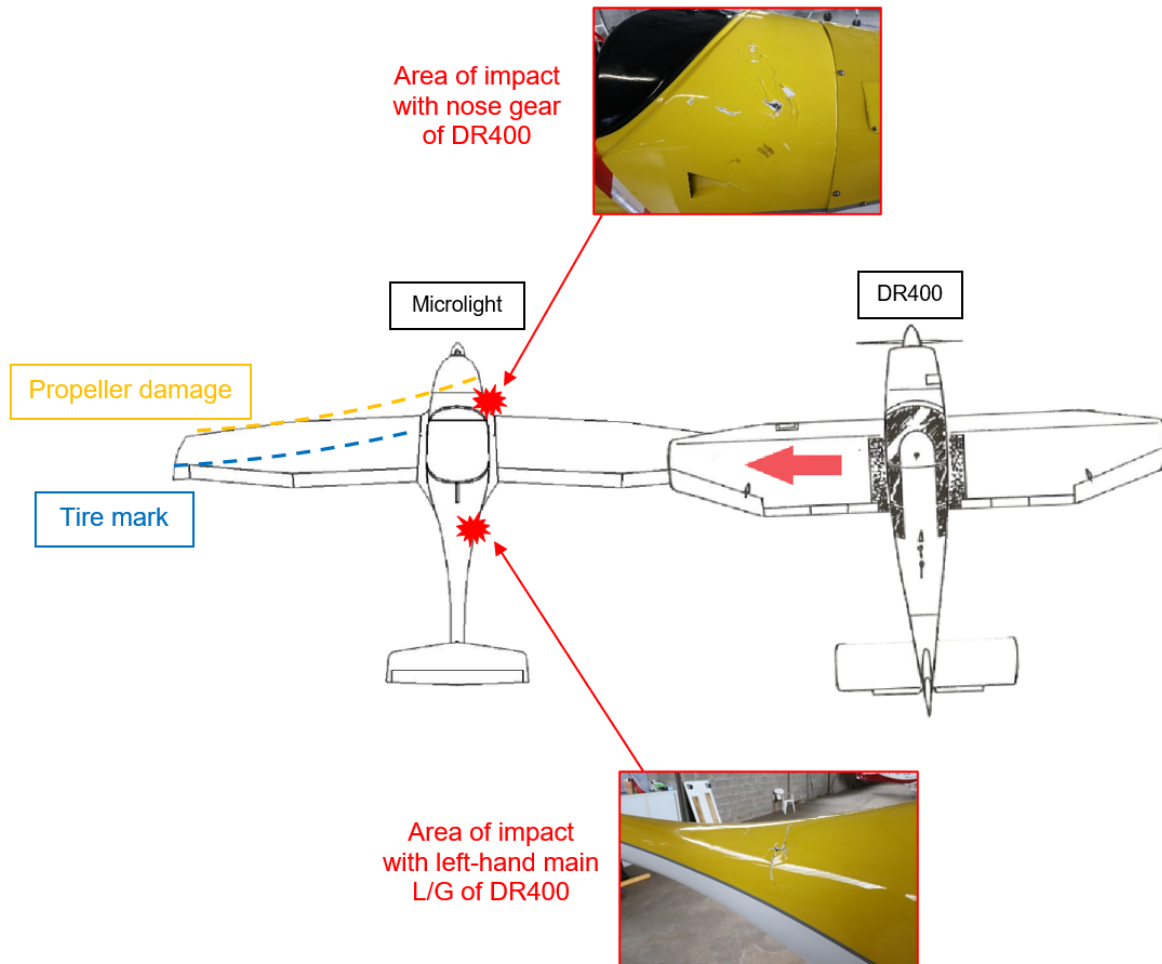


Figure 6: estimated paths of the two aircraft at the time of the collision (Source: BEA)

2.4 Pilot information

2.4.1 DR400 instructor's experience and statement

The 71-year-old instructor held an aeroplane pilot licence, a glider pilot licence and a microlight pilot certificate. He had logged more than 3,500 flight hours on aeroplanes, almost all on DR400s and mainly in instruction.

He stated that during the accident flight, the pilot was the radio operator. However, he specified that he announced over the radio that they were beginning an exercise for an approach starting overhead facilities. According to him, many people were using the frequency 123.5 MHz that day, and several aircraft pilots were present at Lunéville at the time of the accident: an aircraft was taxiing at the parking area, another aircraft was on approach to Lunéville and another one was on the ground. He was unaware of the presence of a microlight on approach to or landing on

runway 09. As a consequence, he had not identified any potential conflict with carrying out a practice forced landing. He reported that there were a few spurious messages over the frequency, as is often the case with the frequency 123.5 MHz. He thought that he transmitted a radio message on short final.

He stated that, at a height of approximately 20 m, he suddenly saw an aircraft arriving from below. He did not have time to act and they collided. He specified that, when carrying out a practice forced landing with a steep angle, it is difficult to see what is below.

2.4.2 DR400 pilot experience and statement

The 56-year-old pilot held an aeroplane pilot licence issued in 1990. He had logged approximately 800 flight hours.

He reported that on arriving at Lunéville, he announced over the radio all the circuit joining messages (downwind leg, base leg and go-around). He was instructed to climb to 3,000 ft to practise an approach starting overhead facilities. He then announced over the radio that he was flying overhead the aerodrome, then the instructor announced that they were carrying out a practice forced landing.

On short final, at a speed between 125 and 130 km/h approximately, he saw an aircraft appear suddenly just below them. Instinctively, and in an attempt to dampen the impact, he pulled the stick and turned left. The aeroplane then stalled and fell onto the pile of rubble, on the axis of the runway.

He did not remember hearing over the radio that there were other aircraft likely to interfere with them while carrying out a practice forced landing. However, he remembered that there were other people over the frequency.

2.4.3 Microlight pilot experience and statement

The 63-year-old pilot held an aeroplane pilot licence issued in 1978. He had logged more than 500 flight hours on aeroplanes. He stopped most of his aeroplane activities in 2010 when he bought his microlight. However, he continued revalidating his Single-Engine Piston (SEP) class rating until 2019. He held a fixed-wing microlight pilot certificate with passenger carrying privileges issued in 2010, for which he had logged more than 500 flight hours. The pilot was also a military air traffic controller.

He stated that he monitored several frequencies during his local flight after leaving Lunéville: the Saint-Dié - Remomeix aerodrome frequency and the Strasbourg FIS frequency, over which he did not hear any messages. According to the pilot, he then selected the A/A frequency 123.5 MHz while returning to Lunéville. He specified that in the microlight, the radio selection and display instruments are located on the passenger side and not in front of the pilot. He stated that he made the radio announcements on approach to the aerodrome, overhead of it, during the downwind leg, in base leg and on final. He thought that he heard other pilots transmitting messages on the same frequency, some of which overlapped or were difficult to hear. However, he considered that he was alone in the circuit at Lunéville.

On final at a height of approximately 20 m, he heard a loud noise and the engine of the microlight shutting down. He made a sidestep to land on the grass runway 09R, which seemed safer to him.

On the ground, he found that the engine cowling was completely open.

2.4.4 Microlight passenger statement

The passenger stated that he had no aeronautical knowledge and that he was unable to understand the radio exchanges. At the time of the collision, he did not understand what was happening.

He reported that he had hearing problems and that he was not wearing his hearing aids. However, he could hear the pilot in his headset. He specified that there was a small number of exchanges between them in the second part of the flight and that he did not touch the instruments or disturb the pilot during the flight. On the return leg of the flight at Lunéville, he did not remember hearing any radio messages from other pilots.

2.5 Radio communication information and other statements

In the absence of recordings of radio communication exchanges⁵, several other pilots were interviewed during the investigation, and the following appeared from these:

- by cross-checking statements, a radio message from a pilot present at Lunéville aerodrome was heard by the pilots of F-GLDN on returning from their flight;
- a pilot at Sarrebourg - Buhl aerodrome (also using the A/A frequency 123.5 MHz) heard the radio message indicating that F-GLDN was beginning a practice forced landing;
- the investigation was unable to confirm the transmission of other messages by the pilots of F-GLDN or the pilot of 44APT during the accident sequence.

The BEA did not identify any nearby aerodrome, including in neighbouring countries, using the frequency 125.5 MHz, which was set as the active frequency on the microlight's radio.

The stand-by frequency set to 120.7 MHz on the microlight's radio corresponded to that of the Strasbourg FIS, valid until the day before the event. The NOTAM LFFA-A6317/24 indicated that from 28 November, the FIS frequency 120.700 MHz would be replaced by 136.135 MHz, and that the APP frequency 120.700 MHz would be replaced by 120.400 MHz.

3 CONCLUSIONS

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

Scenario

During a licence revalidation flight, the instructor and the pilot of the DR400 were carrying out a practice forced landing at Lunéville - Croismare aerodrome. They monitored the published A/A frequency (123.5 MHz) and thought that there were no other aircraft in the aerodrome circuit.

The pilot of the microlight, on the return leg of a local flight from Lunéville aerodrome, most probably mistakenly selected the frequency 125.5 MHz instead of 123.5 MHz. His radio messages were not heard by the other users of the aerodrome, and he thought that he was alone in the aerodrome circuit.

⁵ In accordance with the Order of 9 June 2020 on recording of data relating to air traffic management, their storage and use, A/A frequencies are only required to be recorded in the case of radio communications made in an ATS organisation ([Version in force on the day of the accident](#)).

On short final for runway 09, the two aircraft collided at a height of approximately 20 m. The pilot of the DR400 saw the microlight below him at the last moment, and instinctively tried to dampen the impact by pulling on the stick. The aeroplane stalled and fell into a field full of rubble located on the axis of the runway. The pilot of the microlight thought he had suffered an engine “explosion” and performed an emergency landing on the unpaved runway.

Contributing factors

The following factors contributed to the mid-air collision:

- the incorrect selection of the radio frequency by one of the pilots, preventing communications and good situational awareness of the pilots of the two aircraft using the A/A frequency;
- the respective lack of visibility due to the approach paths of the two aircraft, with the DR400 arriving at a steep angle for a practice forced landing, over and behind the microlight.

Safety lessons

Mid-air collision

Since 2010, taking into account the mid-air collision between F-GLDN and 44APT, the BEA has recorded 20 accidents due to mid-air collisions between two aircraft in France, seven⁶ of which were fatal resulting in the death of 16 people.

This human cost could have been higher, as shown in the collision between the [EC155 registered F-HEGT and the Nord 1203 registered F-AYVV](#) on 8 February 2024, and in the collision between F-GLDN and 44APT, covered in this report. During these two events, the aircraft suffered substantial material damage, but none of the 15 people involved were severely injured.

Of the twenty accidents, six – including two fatal accidents – occurred in the aerodrome circuit (four people fatally injured). Five of these six accidents took place while using the A/A radio frequency. The pilots relied essentially on the radio to communicate their position and on visual observation to detect the presence of nearby aircraft.

The five mid-air collisions when using the A/A radio frequency involved either no radio communication or a lack of radio communication from at least one of the pilots.

Five of these six accidents involved at least one pilot under instruction⁷.

These elements are a reminder of and confirm the analyses and conclusions of the BEA study “[Mid-Air Collisions 1989-1999](#)”, which listed the 17 mid-air collisions that occurred in the period mentioned. Seven of these collisions occurred in the aerodrome circuit (including six in an A/A frequency context), and nine of these collisions occurred during instruction flights with an instructor on board:

- *“The see-and-avoid rule can therefore be faulted due to the physiological limits of human sight, accelerated speeds and the ergonomics of aircraft.”*
- *“In every case of a mid-air collision near an aerodrome, the radio was not used correctly or, the integration procedure or the runway circuit was not respected.”*

⁶ One of the accidents is classified as non-fatal because the pilot passed away more than 30 days after the occurrence, exceeding the time limit defined for a “fatal injury” under Regulation (EU) N. 996/2010 governing the investigation and prevention of accidents and incidents in civil aviation.

⁷ Including one supervised solo flight.

- *“Flights with several pilots or instruction flights can cause a transfer of attentiveness towards the other pilot. Increase in the cockpit workload can lead to a decrease in outside monitoring.”*
- *“The explicit sharing of outside monitoring is desirable before a flight with two persons.”*
- *“This study shows that all pilots whatever their age, their qualifications or the flight rules applied can be confronted with the risk of mid-air collision. The number of these accidents is low, but they often have serious consequences.”*
- *“The increasing number of aircraft, the complexity of certain routes, the improved performances and ergonomics of cockpits should incite pilots to use all means available in order to detect and to be detected by others.”*

Electronic conspicuity: be seen, see and avoid

The “see-and-avoid” rule shows many limitations and proved to be deficient in a number of accidents. To improve pilots’ situational awareness and facilitate visual acquisition of surrounding traffic, a number of uncertified traffic detection systems were developed for light aviation⁸. Some of these systems are interoperable, which substantially improves visibility of surrounding traffic.

Following these observations, EASA published [additional information on this topic](#) on its web site.

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

⁸ See para. 1.18.3 of the report on the [accident to the Robin DR400 registered F-BXEU and to the Alpi Aviation Pioneer300 identified 37AHH on 10 October 2020 at Loches \(Indre-et-Loire\)](#).