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INVESTIGATION REPORT

Accident of Socata TB20 registered D-SLHS occurred on November 25, 2016 at Jarsy (73), altitude 6690 ft

Hour	Around 14 h 40 (1)
exploiting	Private
Type of flight	General Aviation
Persons on board	Pilot and one passenger
Consequences and damage	Driver and deceased passenger aircraft destroyed

(1) Unless otherwise specified, hours in this report are expressed in local time.

Collision with Terrain

1 - FLIGHT SCHEDULE

The pilot, accompanied by a passenger, took off under IFR flight plan from Dortmund airport (Germany) to the airfield Albertville (73) at 11 h 35. It goes up to FL 130 (2) and continued the flight as shown in the flight plan. The pilot contacted the controller Geneva overflight of Swiss airspace and says he wants to make a " *breakthrough* "IFR Chambery" *pass* "Under the cloud layer. The controller tells him to head the SALEV points then descend to FL 100 and follow the arrival SALEV 7R. Shortly after (point A, figure 1), the controller asks him to descend to FL 80 and to reduce speed to 120 knots, then a few minutes later to head for the postponement point COLLO (3) and contact approach Chambery.

(2) The aircraft was also equipped an oxygenation system laptop and an oximeter which allowed to fly above FL100.

(3) The postponement COLLO point is the IAF procedure ILS or LOC Y Y RWY 18.

The Chambery approach controller application (point B) the pilot to descend to 6500 ft QNH 1014 hPa and turn left 20 °, and then to continue the course to intercept " *Yankee runway localizer 18* "Aerodrome of Chambery and to clarify its intentions. The pilot says he wants to ILS for runway 18 " *pass* "Under the layer and then proceed VFR to Albertville. The controller asked him to call " *established on the ILS* "And tells him that there is more speed restriction.

Shortly after (point C), the driver indicates to the radio that is provided VMC 6500 ft and wishes to turn left to go directly to Albertville. A minute later, the controller confirms that the IFR flight plan is canceled and it is now under VFR. The driver says he turns left to Albertville achieve it considers to 14 h 43. The controller asked them (point D) to recall the output of TMA Chambery. Shortly after (point E), the controller tells the pilot that he is out of the TMA, he can leave the frequency and it must not forget to call to close his flight plan once at destination . The pilot read back and says it falls below 5000 ft.

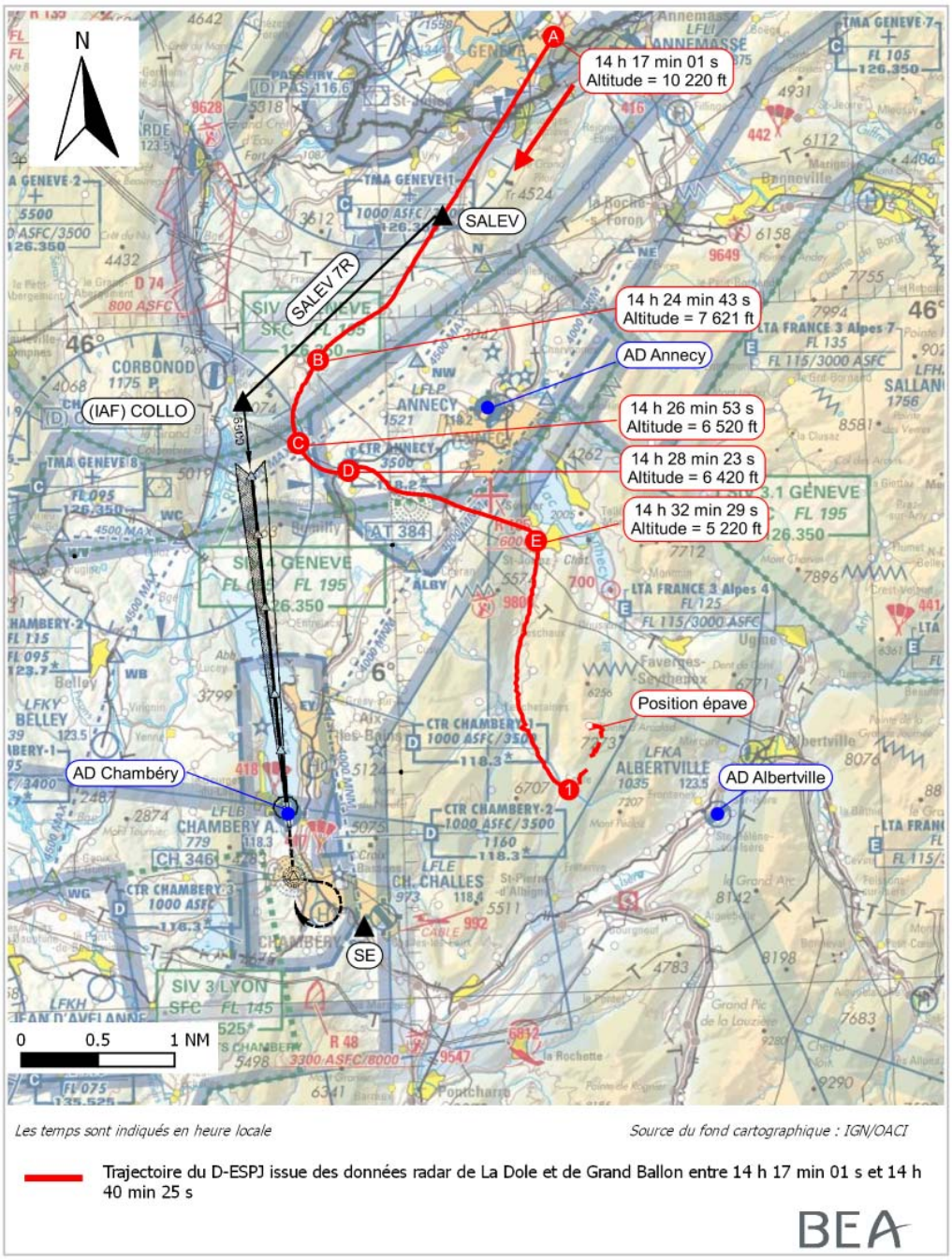

Figure 1: trajectory over the last thirty minutes flight

(4) Area G Area Flight Information (SIV) Marseille Provence, no radio contact mandatory.

From that moment, there is no radio contact (4) with the driver. The driver follows a Albertville direction valley to the point 1 of the path (Figures 1 and 7) and then takes a substantially north heading uphill, before turning towards the west. The aircraft struck the mountain about ten meters below a ridgeline. Part of the wreckage was found on impact and another 280 meters down against a rock wall.

2 - ADDITIONAL INFORMATION

2.1 Experience pilot

The pilot, airplane owner, held a commercial pilot license since 2000 and qualified for instrument flight since 1999, totaled 3,700 (5) flight hours of which 1,600 IFR and about 20 hours in the previous three months on the type.

(5) Flight hours from a CV written by the driver dated October, 2016.

He also held an instructor rating FI (A) (6) valid until July 2017.

(6) FI (A) privileges of CPL instruction PPL SE SP, TMG night, IR.

No paper logbook was found. The pilot, however, kept a notebook computer flight until 2012. Between 2009 and 2012, the pilot flew about 275 hours on TB20. The investigation was unable to determine the number and detail of flight hours performed after 2012.

The passenger, also a pilot, holds a private pilot license, totaled 1,250 flying hours, and according to the evidence collected, flying regularly TB20.

2.2 Aircraft Information

The aircraft was equipped for navigation in addition to conventional instruments, a GNSS (7) KLN94, a multifunction display KMD550, an autopilot and a PFD (8) Aspen EFD1000.

(7) The GNSS (Global satellite navigation system) is a satellite positioning system combining different global coverage systems with the US GPS system is part.

(8) Primary flight display / screen cathode of electronically controlled tube (Artificial horizon).

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Figure 2: dashboard of the plane D-SLHS

2.3 support equipment for navigation and electronic equipment

The pilot had an Ipad which was recovered and analyzed. Many aerospace character applications were installed.

The applications working in the background to power included:

?? GoodReader (9), VFRiCharts and AirNavPro;
?? the GoodReader app was open on the map 11-1 Jeppesen approach (ILS Z OR LOC Z RWY 18) Chambery;
?? VFRichart the implementation was open on a map of Poland, centered Warsaw airport;

(9) PDF Reader.

?? AirNavPro the implementation was open and the map centered on airfield
Dortmund (departure aerodrome).

Given these findings, the pilot probably not used these last two applications to browse the time of the accident. GNSS trace records were archived in AirNavPro application, the latest dated 13 November 2016. The record traces GNSS application in the background was authorized by the iPad's settings and applying it -even. The review of the iPad failed to explain the lack of recording of the flight data.

An SLR type camera was found, and the memory card has been discharged. A photo taken during the accident flight, shows that the owner of the aircraft pilot was in the right seat and the passenger was in the left seat.

2.4 Preparation of the flight

The flight dossier contained the IFR flight plan, the " *log navigation* "Albertville to the aerodrome, the weather forecast information with maps of cloud cover and temperature, METARs and TAFs Aerodrome Road and NOTAM.

The flight plan posed by the pilot provided a takeoff airfield Dormund (EDLW) 10 00 UTC under IFR flight plan, a speed of 150 kt, a flight level FL130, to the Albertville airfield for a flight time of 3 hours 06 minutes and Chambery as alternate.

On the morning of the accident, the pilot had delayed the departure of 30 minutes, 10 h 30 UTC, probably due to the late delivery (10) of the oxygen cylinder.

(10) An invoice dated the day of the accident for an oxygen bottle was found.

Meteorological information for Chambery (LFLB) present in the flight record and available to the pilot indicated:

?? METARs for 08 h 30 UTC, visibility greater than 10 km and a layer
Cloud welded to 2400 ft;
?? for TAF 05: 00 UTC, visibility greater than 10 km and a layer
Cloud fragmented 2000 ft welded to 3000 ft and temporarily between 07 h and 13 h UTC, visibility of 4 km, rain and cloud layer fragmented to 1400 ft.

A map VFR 1/500 000 covering Germany and many VAC charts and IFR approach were found, the VFR chart 1/500 000 covering the Rhône-Alpes region has not been found.

2.5 Weather

Weather conditions estimated on the region were:

?? irregular wind southerly to 8 kt;
?? average to poor visibility under the cloud layer;
?? temperature 3-4 ° C;
?? clouds hanging atop mountain ranges, cloudy in
stratocumulus clouds below 5000 ft and altocumulus above.

Information (D) Chambery ATIS 13: 00 UTC stated:

?? wind 190 °;
?? 2 kt;
?? clouds FEW 5600 ft;
?? BKN 6800 ft and 10 000 ft;
?? QNH 1014.

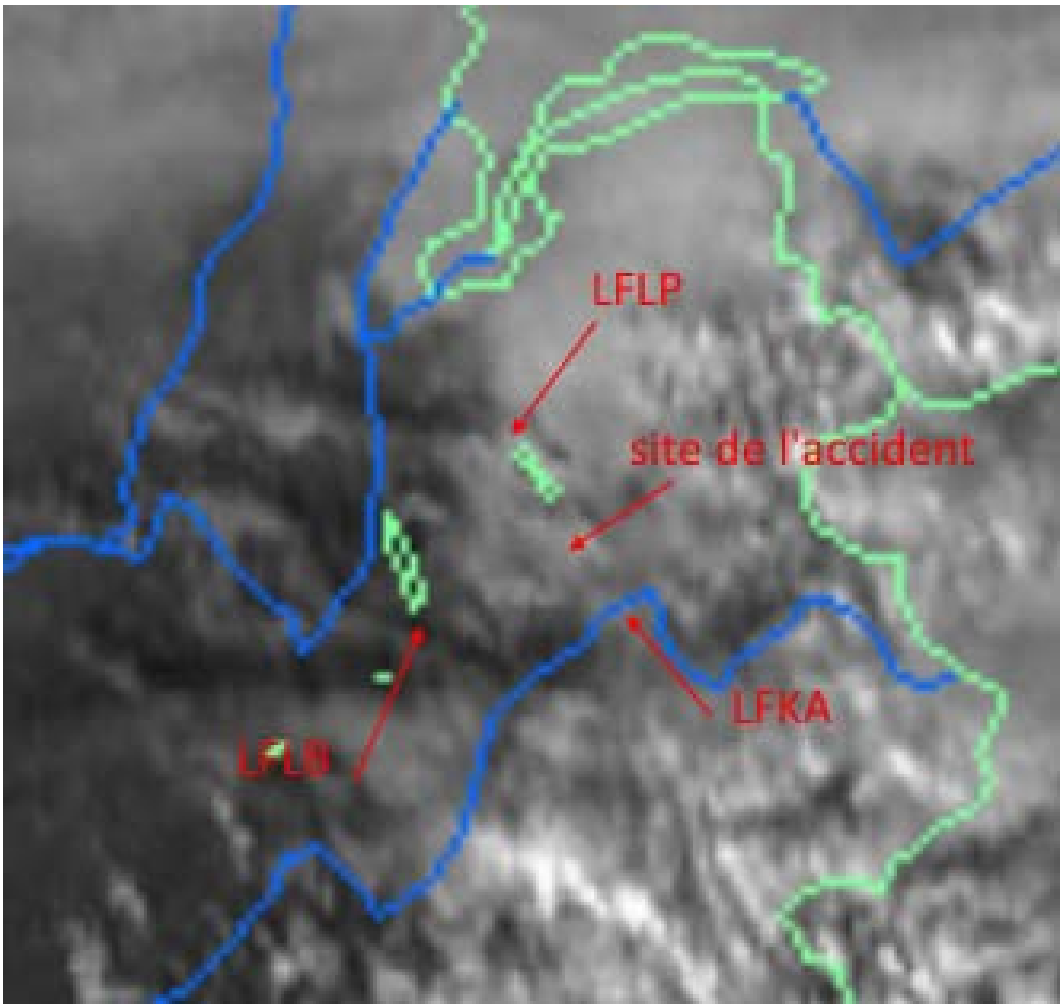
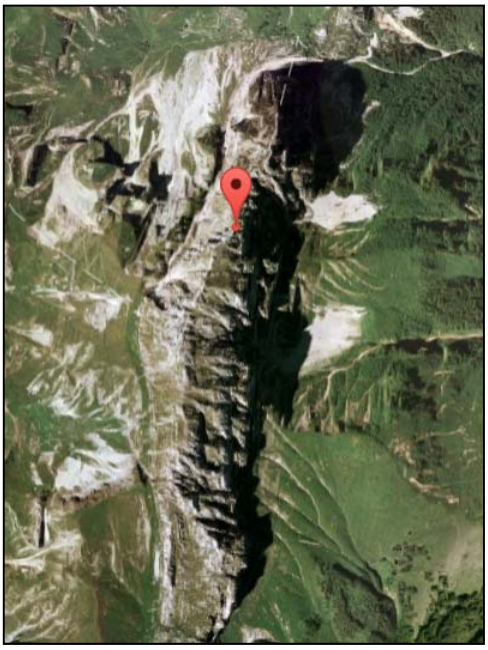


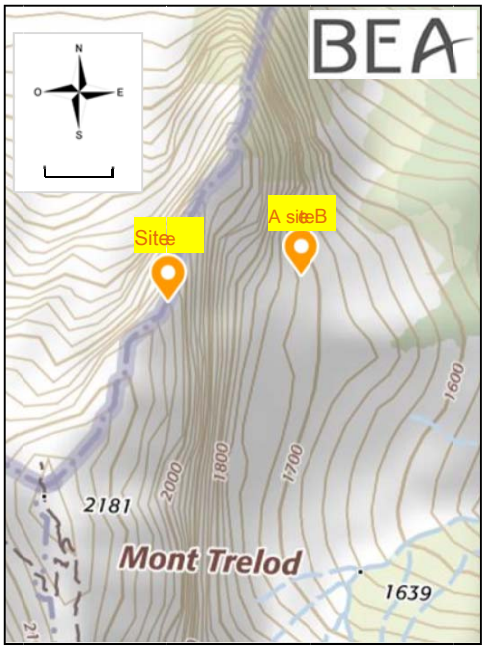
Figure 3: cloud cover at 13 h30 UTC

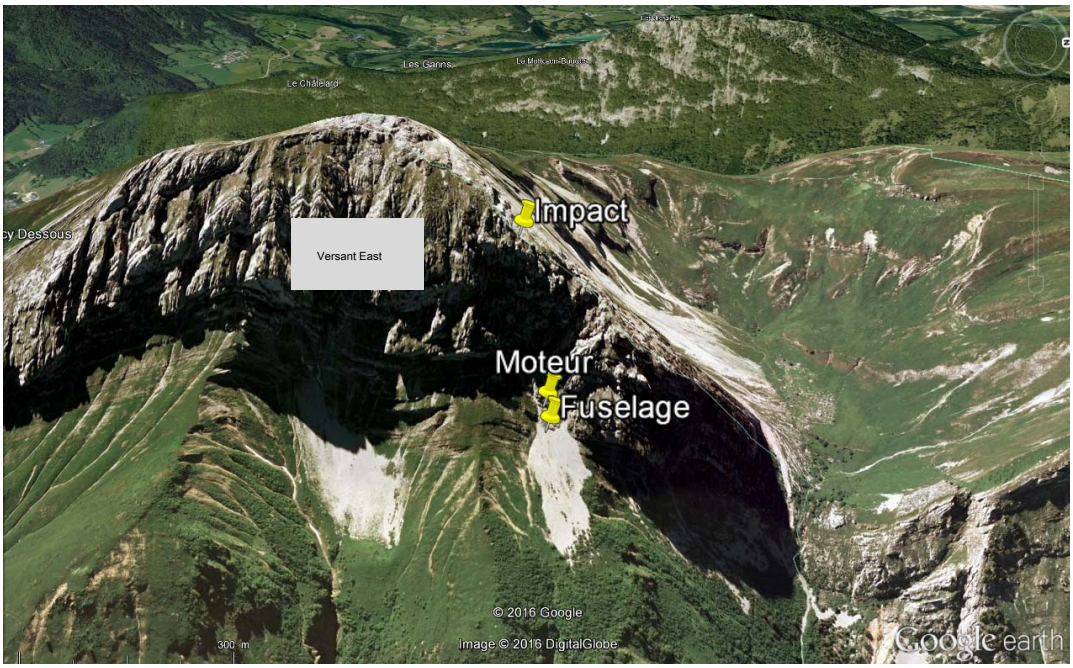
2.6 Review of the site and the wreckage

The impact site (site A, Figure 5) is located on the crest of Mount Trélod (Figures 4 and 5), about 6500 ft above sea level.

The impact took place on the east side, about ten meters from the summit. Most of the debris has been identified on the eastern side, a few fragments were found on the western slope. The fuselage and the engine have been found at the site B (Figures 5 and 6), at an altitude of about 5600 ft. Many remains are visible on the slope between the sites A and B.







Mapping Source: Google Earth

Figure 6: Location of the main elements of the relief (view from east to west)

The path of the aircraft was generally facing west at the time of the accident. The wings were torn off on impact with the terrain, the right wing has not been found. The engine on the left violently impacted terrain. Observations on the propeller blades indicates that the engine was delivering power at the time of impact with the terrain. The level of destruction of the wreck and the safety conditions on site have not enabled a review of continuity of the flight controls.

However the observations of the wreckage did not reveal any prior art impact failures of the aircraft with the terrain and suggest that the aircraft was probably rise with the wings nearly horizontal.

2.7 Radar Tracking and end of the flight

The path of the aircraft could be reconstructed from information transmitted by the various control centers (German, Swiss and French). Towards the end of the flight, the present path loss detection areas likely due to the masking of the aircraft with surrounding terrain.

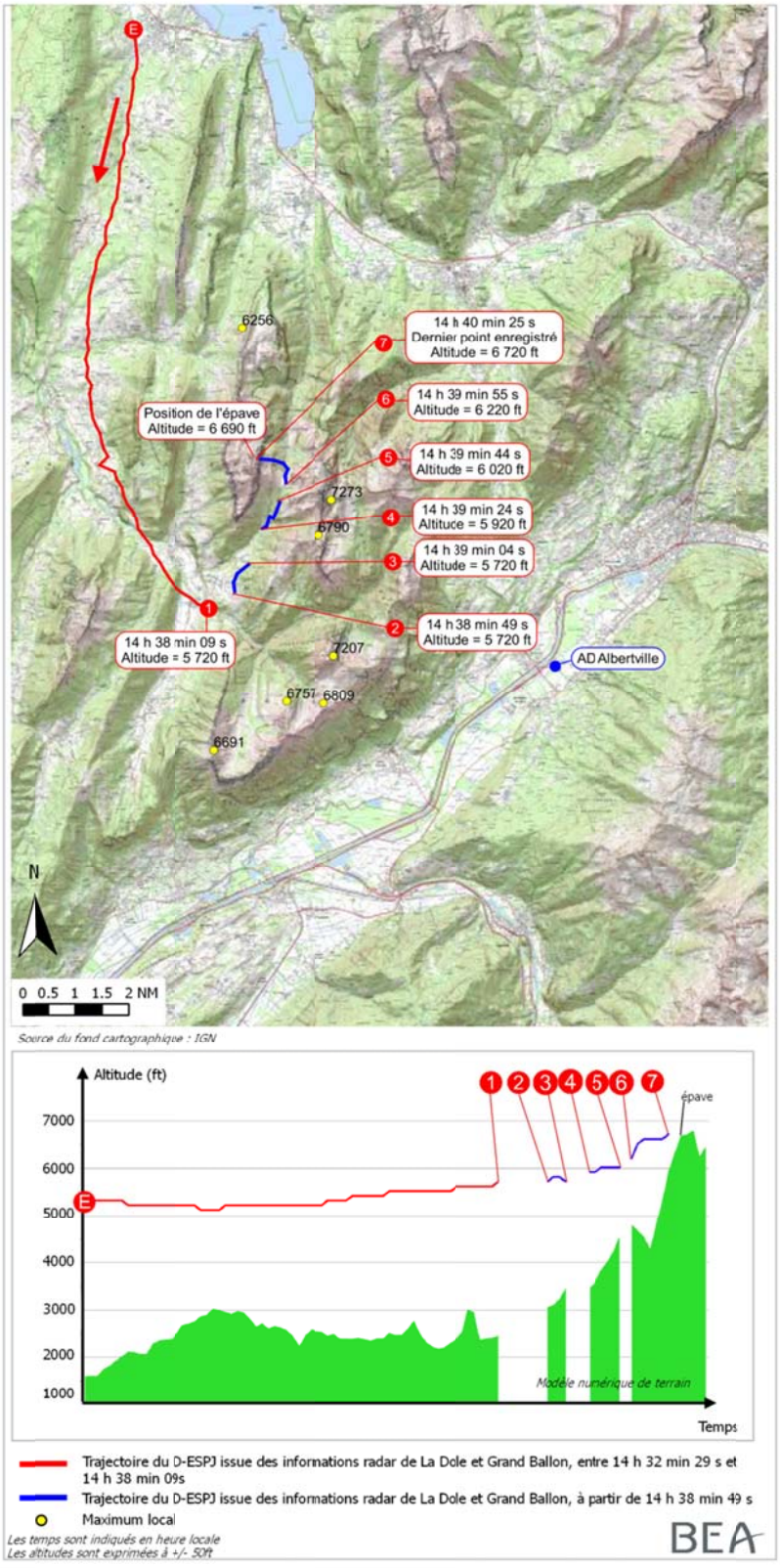


Figure 7: Final trajectory over the last ten minutes of flight

2.8 Testimonials

2.8.1 Instructor Albertville

An instructor Albertville says he was contacted by the owner of TB20 pilot for training for obtaining the site permit for the Courchevel Altiport. They had set a date, planning and training program by email.

The pilot had told him that a friend and driver TB20 accompany him to also take this training. The pilot did not come on the airfield Albertville, he had asked his advice. The instructor says that he had suggested to the pilot in case of inclement weather, to make a breakthrough in Chambéry ILS to go under the layer and then continue south towards the SE point of Chambery to bypass the massif Bauges then move north-east through the valley to Albertville.

He also said the pilot that he had an appointment in the afternoon and he could welcome on arrival before 15 am or after 18 hours. The instructor had told the driver that if he could before 15 hours he could shift his appointment to the theoretical course (lasting about an hour) and place them at the hotel. The pilot replied by email that he planned an arrival around 14 pm local.

The instructor says it has received from the pilot, 18 to 14 am on the day of the accident, the following sms " *30 min* "What he interpreted as the estimated time of landing in Albertville at 14 h 48. From 15 h 10, has still not seen the plane landed, he left for his appointment.

It also states that a cloud layer clung welded peaks north of the airfield and he felt the ceiling at about 5000 ft, but under the cloud layer, the visibility was good.

2.8.2 Other witnesses on the ground

The first witness, microlight pilot, located near the point 1 saw a plane carried two to three sharp turns left and then again towards the north. He believes that the plane was about 6000 ft. He noted that there were fog patches and the clouds and the wind was calm.

A second indicator located in the vicinity of point 4, walking northbound to the neck of Chérel (4900 ft, point 5). He heard the continuous noise of the engine of a plane but did not see. There was thick fog and low ceilings. He said that the noise was coming from the right (East) and headed to the left (west), it indicates that the engine noise increased and he did more heard. He claims to have heard the plane for about 30 seconds.

3 - ANALYSIS AND CONCLUSIONS

3.1 Functions on board

The photograph taken during the flight shows that the passenger is left in place and the instructor in the right seat. The instructor by his skill level was the captain of that flight. The passenger could be in command as a pilot during VFR flight phases and as a student under the supervision of the instructor during phases of flight IFR.

It was not possible to determine who was the flying pilot at the time of the accident.

3.2 Cancellation IFR and VFR route

The pilot requested the cancellation of the IFR flight plan and continued VFR flight when he was at an altitude about 6500 ft below the cloud layer in accordance with the intentions he had announced controllers Geneva Chambery.

While the instructor Albertville had suggested to move towards the SE point of Chambery then up through the valley towards the Albertville airport bypassing the Bauges, the pilot is heading southeast to Lake Annecy (point E) before making a significantly south road towards Jarsy following a valley in the Bauges. Weather conditions encountered in Chambery (ATIS information BKN 6800 ft) were more favorable than those provided by the TAF (BKN 2000 ft, 3000 ft OVC) available to the driver before departure. It is likely that the weather conditions encountered caused the pilot to take a more direct route to Albertville across the Bauges.

Radio communications show that the pilot made no request for weather information from the Chambery controller.

3.3 times Constraint

The pilot took off from Dortmund airport with 30 minutes late. mail exchanges between the pilot and the instructor Albertville highlight a time constraint on arrival in Albertville. The pilot had intended effect of land in 14 hours to be able to do the theoretical course and not have to wait up to 18 hours on the back of the instructor on Albertville.

Because of the delay at the start, and given favorable weather in Chambéry, it is likely that the pilot decided to take a more direct route to make up some of the delay. Sending sms " *30 min* "By the pilot instructor to indicate that it would land before 15 hours seems to confirm this constraint.

3.4 Passage in IMC

The trajectory to the point 1 would indicate that the pilot was changing VMC and intended to join the Isère valley. The study of the map shows that the relief is significantly rises to the south and east of this point and is a mountain range on the trajectory with peaks over 6600 ft. The coverage map cloudy (Figure 3) also shows a densification of the cloud mass on the eastern Bauges.

Arrived to Jarsy (point 1), the driver making several turns, as indicated by one of the witnesses, probably trying to see if it was possible it to stay under the cloud layer and continue the flight to Albertville, before reconsider and take a drive north.

The trajectory initially followed after point 1 seems to indicate an intention to head to Lake Annecy following the valley between Mount Trélod (west) and the Mount of the Coche (east) with a plane slightly uphill.

According to a witness, at the approach of Chérel Pass (4900 ft), the clouds hung on the surrounding peaks with fog banks. It is very likely that the approach to this pass, the plane has entered into IMC. The climb rate then increased significantly with the driver probably aware of the presence of the surrounding terrain. Some VFR charts on board the plane have not been found. It was not possible to ascertain what information about the relief could have the driver.

It is not possible to determine whether the left turn is the result of a deliberate action by the pilot flying or roll escaped having led to a course alteration of 90 ° undetected. The irregularities of the path also suggest that the pilot probably not using the autopilot to manage the heading and altitude of the aircraft. The attempt to turn around is very unlikely given the attitude of the aircraft observed on site during the collision with the wall.

3.5 Conclusion

The collision with terrain results from the pilot's decision to continue the flight in degraded weather conditions that led to an IMC passage in mountainous areas.

Choosing a more direct route to the destination aerodrome likely to make up some of the backlog at the start of the flight, due to a time constraint on arrival, have contributed to the accident.