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Aircraft Accident Investigation Bureau AAIB

# **Final Report No. 1947 by the Aircraft Accident Investigation Bureau**

concerning the accident

to the Cessna 172RG aircraft, registration HB-CLN

on 19 June 2005

on Dittingen airfield

15 km south-west of Basle

Bundeshaus Nord, CH-3003 Berne

**Ursache**

Der Unfall ist darauf zurückzuführen, dass das Flugzeug während eines Durchstarts ausser Kontrolle geriet und abstürzte, weil eine unzweckmässige Flugtaktik gewählt wurde.

Diese unzweckmässige Flugtaktik war gekennzeichnet durch:

- Unstabilisierter Endanflug
- Später Entscheid für einen Durchstart
- Falsche Konfiguration, welche zu Leistungseinbussen des Flugzeuges führte
- Unterschätzung des Wind- und Lufttemperatureinflusses

## General information on this report

This report contains the AAIB's conclusions on the circumstances and causes of the accident which is the subject of the investigation.

In accordance with Annex 13 of the Convention on International Civil Aviation of 7 December 1944 and article 24 of the Federal Air Navigation Law, the sole purpose of the investigation of an aircraft accident or serious incident is to prevent future accidents or serious incidents. The legal assessment of accident/incident causes and circumstances is expressly no concern of the accident investigation. It is therefore not the purpose of this investigation to determine blame or clarify questions of liability.

If this report is used for purposes other than accident prevention, due consideration shall be given to this circumstance.

The definitive version of this report is the original in the German language.

All times in this report, unless otherwise indicated, are indicated in the standard time applicable to the area of Switzerland (local time – LT), corresponding at the time of the accident to Central European Summer Time (CEST). The relationship between LT, CEST and coordinated universal time (UTC) is:  $LT = CEST = UTC + 2 \text{ h}$ .

For reasons of protection of privacy, the masculine form is used in this report for all natural persons, regardless of their gender.

## Final Report

Owner	Private
Operator	Private
Aircraft type	Cessna 172RG
Country of registration	Switzerland
Registration	HB-CLN
Location	Approx. 100 m south of Dittingen airfield
Date and time	19 June 2005, 15:01 LT

### General

#### Brief description

On 19 June 2005, the pilot of the Cessna 172RG intended to land at Dittingen airfield. In addition to the pilot, there was one passenger on board the aircraft.

After his radio message to the effect that he wanted to land at Dittingen airfield, the pilot received information that the conditions were unfavourable and he was advised against landing. Despite this information, the pilot continued his approach.

During the approach, the pilot initiated a go-around over the runway. The aircraft just managed to clear the trees bordering the airfield. The pilot then lost control over the aircraft. It collided with the terrain south of the airfield. The occupants were fatally injured and the aircraft was completely destroyed by fire.

#### Investigation

The investigation was opened on 19 June 2005 at 18:20 LT by the AAIB in cooperation with the Basle land cantonal police and the local fire brigade.

The accident is attributable to the fact that during a go-around, control over the aircraft was lost and it crashed because an inappropriate flying tactic had been chosen.

This inappropriate flying tactic was characterised by:

- an unstabilised final approach
- a late decision for a go around
- a wrong configuration, which led to performance losses of the aircraft
- underestimation of the effects of wind and air temperature

## 1 Factual Information

### 1.1 Pre-flight history and history of the flight

#### 1.1.1 Pre-flight history

Dittingen airfield is a private airfield to which pilots may fly only if they are familiar with the particular conditions of the airfield.

On 28.05.2005, a pilot familiar with Dittingen took the pilot involved in the accident as a passenger in a power glider Super Dimona and showed him the procedures to be applied in Dittingen. In the process, a go-around was also flown. The pilot familiar with Dittingen chose the departure path with the lowest obstacles (see Annex 1, figure 1.1, "yellow" departure path and Annex 3.1, figure 3.1). After the accident, this pilot stated: "*Zum Abschluss habe ich den Wunsch geäußert, wenn er mit seiner Cessna das erste Mal den Flugplatz anfliegen wird: 1. Ohne Pax + 2. Nicht bei Bise.*" (In conclusion, I expressed the wish to him, if he was flying with his Cessna to the aerodrome for the first time: 1. without passengers + 2. not if there is a 'Bise' wind).

On Sunday 19.06.2005, the owner of the aircraft carried out a flight in HB-CLN from Altenrhein to Basle. Take-off time was 11:55 LT and landing time 12:40 LT.

After the landing, the owner of the aircraft parked the aircraft at about 13:15 LT on a parking space in the GAGBA area of Basle-Mulhouse airport, where it was later taken over by the pilot involved in the accident.

According to the records, the pilot refuelled with 40 litres of Avgas; on take-off there were approximately 140 litres in the tanks.

At 13:30 LT the pilot telephoned Dittingen airfield. He made known his intention to land on Dittingen airfield. The pilot was told that visibility was good but that a strong 'Bise' wind was blowing and that a landing would therefore be difficult. One could not guarantee that he would be able to land. On his first call, he would receive information from the operations manager.

#### 1.1.2 History of the flight

The pilot took off from Basle-Mulhouse airport on 19 June 2005 at 14:45 LT. The air traffic controller (ATCO) did not assign a transponder code to the aircraft. At 14:51 LT, the pilot signed off from the Basle control tower.

Before the approach to Dittingen airfield, the pilot reported to the airfield by radio. He was advised by radio against landing because of unfavourable weather conditions. He made known his intention to make an approach, with a possible go-around.

Eyewitness A, who was a pilot with the Dittingen gliding club, reported that on the base leg the aircraft adopted an unusual flight path. He was apparently flying relatively low. The pilot then missed the centre line of the runway and subsequently attempted to regain it from the other side. He reported that he was initiating a go-around when passing the hangar.

Eyewitness A stated the following (translated from German): "He then flew with the landing gear down and flaps down relatively far along the runway before he reported: 'I'm going left'. In my estimation he could just clear the trees at the edge of the wood – with the landing gear still down. The engine was running normally. I didn't hear any howling ... I thought he'd made it, when a little later I heard a bang."

The aircraft collided with the terrain and the two occupants were fatally injured. A fire caused by the impact then broke out. The aircraft was destroyed.

## 1.2 Injuries to persons

	Crew	Passengers	Third parties
Fatally injured	1	1	---
Seriously injured	---	---	---
Slightly injured or uninjured	---	---	---

## 1.3 Damage to aircraft

Aircraft HB-CLN was destroyed. The following findings could be established after the accident:

- The front part of the fuselage was pushed in.
- The emergency location transmitter (ELT) was destroyed by the fire.
- The landing gear was retracted on impact.
- Both wings were snapped off at the fuselage.
- The flaps were in the 30° position.
- The cockpit was completely burnt out.
- No information could be obtained about the positions of the controls, the instruments or the radio equipment.
- The engine did not show any major, externally visible damage.
- The propeller blades were broken off near the boss. The fractures on the propeller blades indicated that the engine was providing power at the time of impact with the ground.
- Most of the fuel in the wing tanks was burnt.
- When the burnt-out wreck was recovered on the day following the accident, some 30 litres of fuel could be removed from the right wing tank.

## 1.4 Other damage

Moderate crop damage.

## 1.5 Personnel information

### 1.5.1 Pilot

Person	Swiss citizen, born 1956
Licence	Private Pilot's Licence PPL (A), issued by the Federal Office for Civil Aviation on 02.04.1997, valid till 17.05.2007
Registered class	SEP (land)

Ratings ACR (Aerobatics)

Medical fitness certificate Class 2

Last medical examination 25.06.2003

#### 1.5.1.1 Flying experience

The pilot's flying hours could not be ascertained precisely, because the documents were destroyed in the fire.

The total flying hours could be determined approximately from various documents:

<b>Document</b>	<b>Flying hours</b>
Information on the Aeronautical Training form dated 05.05.2003:	313:35 hours
Information in the HB-CLM logbook after 05.05.2003	approx. 32 hours
According to information from his flying instructor for aerobatics training after 05.05.2003	approx. 27 hours
<b>Total</b>	<b>approx. 372 hours</b>

No information could be obtained about the number of flying hours during the 90 days preceding the accident.

#### 1.5.2 Passenger

Swiss citizen, born 1965

No flying experience

### 1.6 Aircraft information

Manufacturer Cessna Aircraft Company, Wichita (USA)

Aircraft type CE 172RG

Characteristics Single-engined, 4-seater high-wing with variable pitch propeller and retractable landing gear

Year / serial No.: 1981 / 172RG0970

Engine Piston engine, Textron Lycoming O-360-F1A6

Propeller Three-blade variable pitch propeller, MTV-12-B

Airworthiness certificate Issued by the Federal Office for Civil Aviation on 08.09.1995

Certification Private  
VFR by day  
VFR by night

Flying hours till 19.06.2005	4471:14 hours airframe
Mass and centre of gravity	<p>The aircraft's highest permissible take-off mass was 2650 lbs.</p> <p>The mass of the aircraft at the time of the accident was approximately 2215 lbs and the centre of gravity was 41.7 in.</p> <p>The mass and centre of gravity were within the prescribed limits at the time of the accident.</p>
Maintenance	<p>The last 200-hour check was carried out on 15.11.2004 at 4418:24 hours.</p> <p>Subsequently, on 03.01.2005, the conversion to an MTV propeller was carried out.</p> <p>The hydraulic power pack was replaced on 20.04.2005.</p>
Fuel	At the time of the accident, the aircraft still had approximately 130 litres of Avgas in the tanks.
Flight time remaining	Estimated for a further 3:15 hours

Information from the owner: the owner flew 12:52 hours on the aircraft between 04.06.2005 and 19.06.2005.

After maintenance work on the retractable landing gear and autopilot and the conversion to a new three-blade propeller carried out a short time before, a thorough check was made of all functions.

## 1.7 Meteorological information

### 1.7.1 General

The information in sections 1.7.2 and 1.7.3 was provided by MeteoSwiss.

### 1.7.2 General weather situation

*Die Schweiz liegt im Einflussbereich eines ausgedehnten Hochdruckgebietes, welches sein Zentrum über Skandinavien hat. Auf der Alpennordseite herrscht eine Bisenströmung.*

Switzerland is in the area affected by an extended high-pressure zone which is centred on Scandinavia. A 'Bise' wind prevailed on the north side of the Alps.



## 1.7.3 Weather at the time and location of the accident

<i>Weather</i>	-
<i>Cloud</i>	<i>No cloud</i>
<i>Visibility</i>	<i>About 30 km</i>
<i>Wind</i>	<i>East-south-east, 6 to 10 knots, gusting to 15 knots</i>
<i>Temperature/dewpoint</i>	<i>27 °C / 11 °C</i>
<i>Atmospheric pressure</i>	<i>QNH LFSB 1017 hPa (Airport BASLE MULHOUSE)</i> <i>QNH LSZH 1019 hPa (Airport ZURICH)</i> <i>QNH EDDS 1020 hPa (Airport STUTTGART)</i>
<i>Hazards</i>	<i>Possible slight turbulence due to 'Bise' wind and high temperatures</i>
<i>Position of the sun</i>	<i>Azimuth: 224°</i> <i>Elevation: 60°</i>

## 1.7.4 Weather according to eye witnesses

Statement by the towing pilot, who was using a Piper Super Cup 180 PS at the time of the accident (translated from German):

"There was a north-easterly wind situation. The wind was strong; I estimate about 25-30 kph tailwind. In the area of the base leg strong turbulence could be experienced.

Because of the strong turbulence, I had to fly approximately 20 kph faster, which "shortened" the runway. Because of this, I had to go around twice consecutively at about 14:00 LT."

At about 15:25 LT, the pilot of the rescue helicopter noted the following weather conditions after landing to the south of Dittingen airfield (translated from German):

"After our landing in REGA 2 about 300 m south of the airfield at 15:22 LT, there were northerly wind conditions with a wind speed of about 3 knots. The smoke from the burning aircraft gave us a good indication in this respect. I also had the impression that the smoke was being forced down towards the ground, probably because of the 'north Föhn wind' over the knoll to the north of the aerodrome."

A trainee pilot, who was a visitor on the airfield up to 13:45 LT, stated the following (translated from German):

" (...) At that time, there was not only a strong tailwind for aircraft which were landing (the Dittingen 'special case') but at the start of the runway especially it was also very gusty. This was also reported by a glider pilot who had just landed (...) It would be incomprehensible to me when the (non-local) Cessna should have received a landing clearance by radio from the 'Dittingers' under these conditions, and for a landing with a strong tailwind."

**1.8 Aids to navigation**

Not applicable.

## 1.9 Communications

Radio communication with the responsible air traffic control unit at Basle-Mulhouse airport took place normally until HB-CLN signed off from the frequency.

Before his approach, the pilot made contact with the operations manager at the airfield in Dittingen.

After the radio message to the effect that he wanted to land on Dittingen airfield, the pilot received information that the conditions were unfavourable. He was advised against landing.

## 1.10 Aerodrome information

Dittingen airfield is a private airfield on which only gliding takes place. It is 15 km south-west of Basle at an elevation of 536 m AMSL. According to the Swiss Aeronautical Information Publication (AIP), the airfield is banned for aircraft from outside.

The runway begins immediately after a terrain edge and extends up the slope. The end of the runway is 21.55 m higher than the beginning of the runway. The end of the runway is also surrounded by a wood with trees up to 27 m high.

In view of this topographical situation, take-offs at Dittingen airfield must always take place on runway 11 down the slope and landings must always take place up the slope on runway 29. In the operating regulations for Dittingen airfield, the take-off and landing procedure is described as follows:

*"– Anflug und Landung auf der Piste 11, sowie Start auf der Piste 29 ist infolge mangelnder Hindernisfreiheit ausgeschlossen.*

*– Der festgelegte An- und Abflugweg ist genau einzuhalten."*

(– Approach and landing on runway 11, and take-off on runway 29 are impossible due to insufficient clearance from obstacles.

– The specified approach and departure route must be complied with precisely).

In view of the unusual topographical features, difficult take-off or landing conditions can occur in certain wind conditions.

In the annex to the Dittingen airfield operating regulations, the circumstances under which pilots from outside may use the airfield are also described. In particular, prior familiarisation is required.

The objective of making pilots familiar with the airfield is to instruct them and show them how operations should be conducted on this airfield, with its special approach and departure procedures. Among other things, the safest flight path for going around is indicated, along with reference to those areas which are to be avoided for reasons of noise.

Since the windsock is in the wind shadow of trees for certain wind directions, it does not always indicate the prevailing wind direction and strength in the area of the airfield.

## 1.11 Flight recorders

Not present and not required.

## **1.12 Wreckage and impact information**

### **1.12.1 Wreckage**

The aircraft crashed in a field at a low horizontal speed. The longitudinal axis of the aircraft was pointing in an approximately south-easterly direction. The few parts which separated on impact of the aircraft all lay in close proximity to the wreck.

Shortly after the impact, fire broke out and the central section of the airframe burned out completely (Annex 1, figure 1.3 and figure 1.4).

The fire brigade were on site shortly after the accident and were able to extinguish the fire.

### **1.12.2 Accident site**

The accident site is approximately 100 metres south of the western end of the runway (Annex 1, figure 1.1).

## **1.13 Medical and pathological information**

The autopsy carried out on the pilot showed that death was the exclusive consequence of the injuries suffered in the crash.

On the basis of the chemical/toxicological tests, the influence of alcohol, drugs or medicines on the accident can be excluded.

## **1.14 Fire**

Immediately after the aircraft crashed, a serious fire broke out; it was fought by the fire brigade, which arrived shortly afterwards.

## **1.15 Survival aspects**

The accident was not survivable.

## **1.16 Tests and research**

A technical examination of the engine, a comparison of the flight involved in the accident with the aircraft's performance data and an analysis of the photographic data were carried out.

### **1.16.1 Engine and propeller**

The engine was subjected to detailed examination after it had been recovered. This provided no indications of any pre-existing defects.

The propeller governor was 20.7 mm from the maximum speed stop and 12.7 mm from the minimum speed stop (see Annex 2, figure 2.1 and figure 2.2).

At full power, this corresponded to a propeller speed of approximately 1800 rpm.

It must be assumed that the governor was displaced somewhat as a result of the slightly asymmetrical impact of the aircraft with the ground, as the aircraft would hardly have been able to climb at a propeller speed of 1800 rpm.

The mixture setting and the position of the carburettor pre-heater could not be determined from the heavily damaged wreck.

1.16.2 Comparison of the accident flight with the aircraft’s performance data

The flight manual gives data only on the best rate of climb, but not on the best climb angle.

Given the conditions which prevailed at the time and location of the accident, for a maximum permitted aircraft take-off weight and a two-blade propeller, the best ROC is indicated at 669 ft/min.

The best climb angle gives a rather lower ROC value, but one which was probably only a little lower because of the three-blade propeller and because the aircraft was not fully loaded.

It can be assumed that the aircraft, with a correct configuration and at a speed of 63 KIAS, would have climbed at an ROC value of approximately 650 ft/min.

1.16.3 Flight path for go-around above the highest trees (accident flight path)

Analysis of the webcam pictures, other photos and calculations using the data from the flight manual, compared with the profile of the terrain (see Annex 3, figure 3.2 Vertical profile), produced the results summarised in the table below,.

It is calculated that about 13 seconds elapsed after initiation of the go-around up to the time the aircraft flew over the trees (immediately before the crash).

In tabular form, the measured values after 13 seconds indicate the following aircraft heights:

<b>Configuration of the aircraft at a speed of 63 KIAS</b>	<b>ROC<sup>1)</sup></b>	<b>Aircraft height<sup>2)</sup></b>	<b>Tree height<sup>2)</sup></b>	<b>The aircraft would have...</b>
Correct configuration for go-around: flaps 20°, landing gear up, propeller speed 2700 rpm	~650 <sup>3)</sup>	Appr. 61 m	42.5 m	reached the required height safely
Configuration during the accident: flaps 30°, landing gear down, presumed propeller speed 2300 rpm	~300 <sup>4)</sup>	Appr. 38 m	42.5 m	not reached the required height
Accident flight: same configuration as above, but with 7 m dynamic altitude gain	~300 <sup>4)</sup>	Appr. 38 m + 7 m = 45 m <sup>5)</sup>	42.5 m	reached the required height, but with a stall

- 1) ROC = Rate of climb in feet per minute [ft/min]
- 2) Heights above the runway threshold
- 3) Estimate of the ROC value based on the information in the flight manual (AFM)
- 4) Average ROC value for the accident flight
- 5) Height reached by the accident flight at the average ROC of approximately 300 ft/min and the dynamic altitude gain of approximately 7 m

This table shows that if the configuration of the aircraft had been correct, the high trees on the chosen flight path could certainly have been cleared at the 63 KIAS speed required for the go-around.

According to the flight manual, for short take-offs (AFM, pages 5-9, "Short Field Take-off", point 9), the landing gear should be retracted only after flying over obstacles, as when it is retracted a short-term additional drag is generated.

In the case of go-arounds, the aircraft flight manual (AFM), page 4-11, "Balked Landing", does not give any information about the position of the landing gear.

After the decision to go around, retracting the landing gear (duration of retraction approximately 3 seconds) would probably have achieved a further gain in height, for a climb time of 13 seconds.

Immediately before the transition to a climb, the pilot was flying at a speed of approximately 70 KIAS, which he had then reduced to the speed with the best angle of climb  $V_x$  = approximately 63 KIAS and consequently achieved the dynamic height gain of 7 m, as was visible upon examination of the webcam photos.

#### 1.16.4 Flight path for go-around over the lowest obstacles

This flight path leads over the left, lower row of trees after the intersecting way.

If the pilot had chosen this departure path, even the performance with the inappropriate configuration of the aircraft would certainly have been adequate (Annex 1, figure 1.1 and Annex 3, figure 3.3 Vertical profile).

## 2 Analysis

### 2.1 Technical aspects

There are no indications of any technical defects which might have contributed to the accident.

### 2.2 Meteorological aspects

Air was being fed from a north-easterly to easterly direction towards the high plateau on which Dittingen airfield is situated. The terrain slopes steeply towards the high plateau, so a higher wind speed probably prevailed on the high plateau (the venturi effect). If one considers the measurements at the nearest stations (Wynau, Delémont, Rünenberg), the mean wind speed above the airfield at 50 m above ground would probably have been about 10-15 kt (direction E-NE). In the area in front of the runway, woods alternate with clearings, causing strong turbulence close to the ground. This turbulence is carried over the airfield area by the wind current.

Over hilly terrain, heavy turbulence must be expected from a mean wind speed of about 20 kt upwards. On the day of the accident, therefore, moderate turbulence would probably have occurred.

### 2.3 Human and operational aspects

The pilot approached the airfield even though he had been made aware by telephone of the unfavourable wind conditions before his departure from Basle.

When the pilot reported for landing just before reaching the airfield and received advice not to land because of the adverse wind conditions, he half-abandoned his definite intention to land and left open the possibility of a go-around. Quote: "*Er sagte, er wolle einen Anflug mit ev. go-around machen*" (He said he wanted to make an approach with a possible go-around).

Apart from the advice not to land because of the adverse wind conditions, there were additional factors which probably put the pilot under considerable stress. The unusually short base leg and final approach, the twice repeated overshooting of the runway centre line with corresponding corrective actions and the effect of the tailwind components at the runway centre line of approximately 5-6 m/s (9-11 kt), with heavy turbulence close to the ground, should be mentioned in this context.

In the final approach, the pilot subsequently omitted to set the propeller control lever to the minimal pitch (high rpm), and during the go-around he omitted to set the flaps from the landing position to the go-around position and to retract the landing gear. This inappropriate configuration, as well as the air temperature of 27 °C very greatly reduced climbing performance.

Nor did the pilot avail himself of the emergency departure path over the restaurant or, a few seconds later, the departure path over the left, lower row of trees after the intersecting way as he had been instructed during familiarisation (Annex 1, figure 1.1, figure 1.2 and Annex 3, figure 3.1).

When turning towards the high trees, the aircraft came under the influence of the full tailwind component of approximately 7-8 m/s (13-15 kt) and this further reduced the angle of climb. When the aircraft flew over the trees, the pilot retracted the landing gear, which briefly generated additional drag. The aircraft stalled and crashed into the terrain.

### 3 Conclusions

#### 3.1 Findings

- The pilot was in possession of an appropriate licence.
- He had completed the necessary familiarisation with Dittingen airfield.
- There were no indications of the pilot suffering any health problems during the flight involved in the accident.
- The investigation showed no indications of any technical faults with the aircraft which might have had an effect on the accident.
- The mass and centre of gravity were within the permitted limits at the time of the accident.
- There was a strong, gusty wind from the east-north-east. The air temperature was 27 °C.
- The pilot made the approach to the airfield even though he had been advised against landing by flight operations because of adverse wind conditions.
- The pilot did not heed the advice to make his first flight to Dittingen in the Cessna without passengers and when there was no tailwind.
- The aircraft was not configured for the go-around.
- The pilot did not make use of the possible departure paths.

#### 3.2 Causes

The accident is attributable to the fact that during a go-around, control over the aircraft was lost and it crashed because an inappropriate flying tactic had been chosen.

This inappropriate flying tactic was characterised by:

- an unstabilised final approach
- a late decision for a go around
- a wrong configuration, which led to performance losses of the aircraft
- underestimation of the effects of wind and air temperature

Berne, 15 February 2007

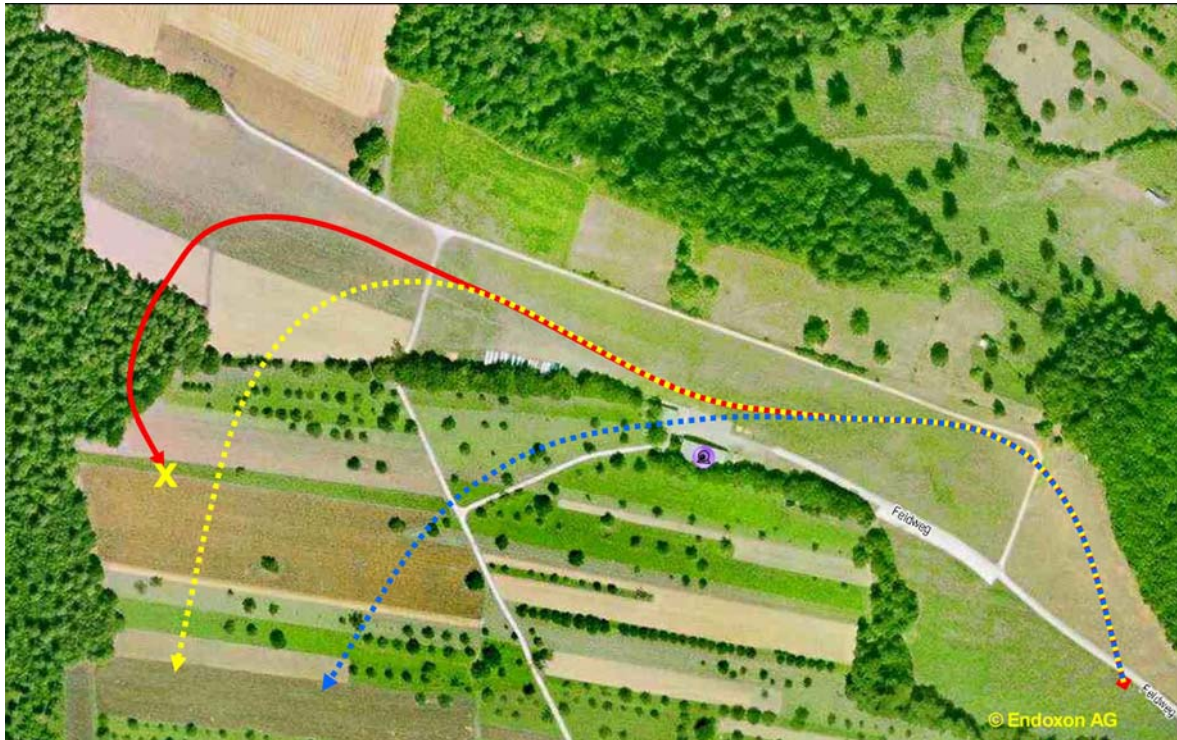
Aircraft Accident Investigation Bureau

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## Annex 1



Ref. Figure 1.1 (copyright by © Endoxon AG):

Extract of chart with overview of the approximate flight path of the aircraft (red flight path) with the point of impact, with the "yellow" departure path for a go-around over the lowest obstacles and with the "blue" departure path over the restaurant.



Ref. figure 1.2:

The pilot did not take the departure path in which he had been instructed for the go-around over the low obstacles (yellow circle on the left). He flew over the high trees (yellow circle on the right).



**Annex 1**

Ref. figure 1.3:

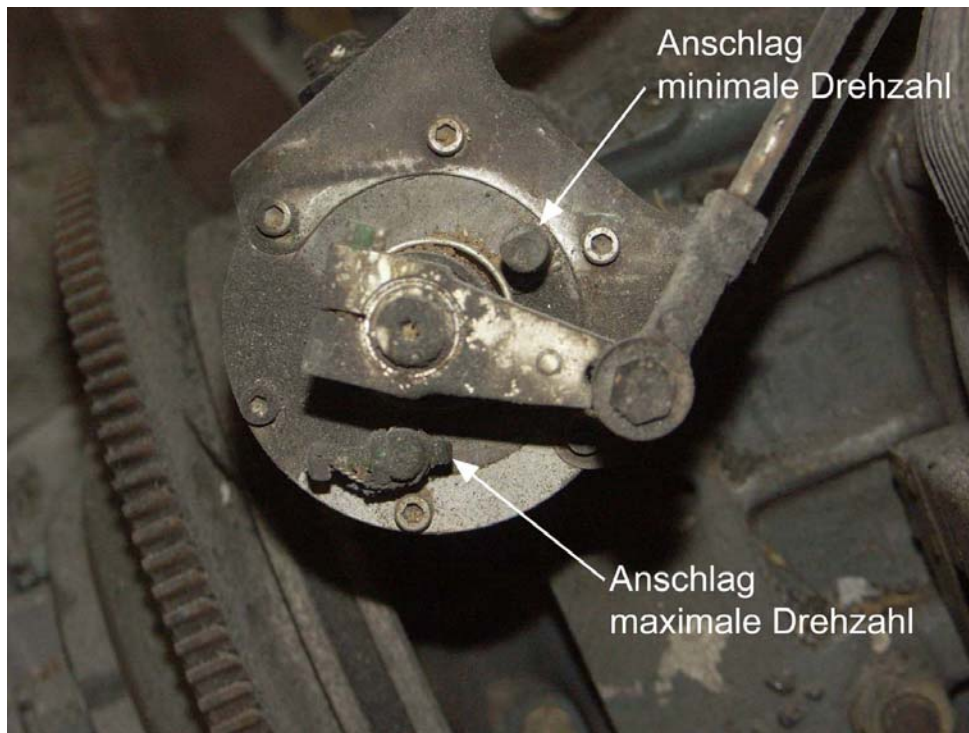
The wreck caught fire shortly after impact. The plume of smoke indicates a strong wind.



Ref. figure 1.4:

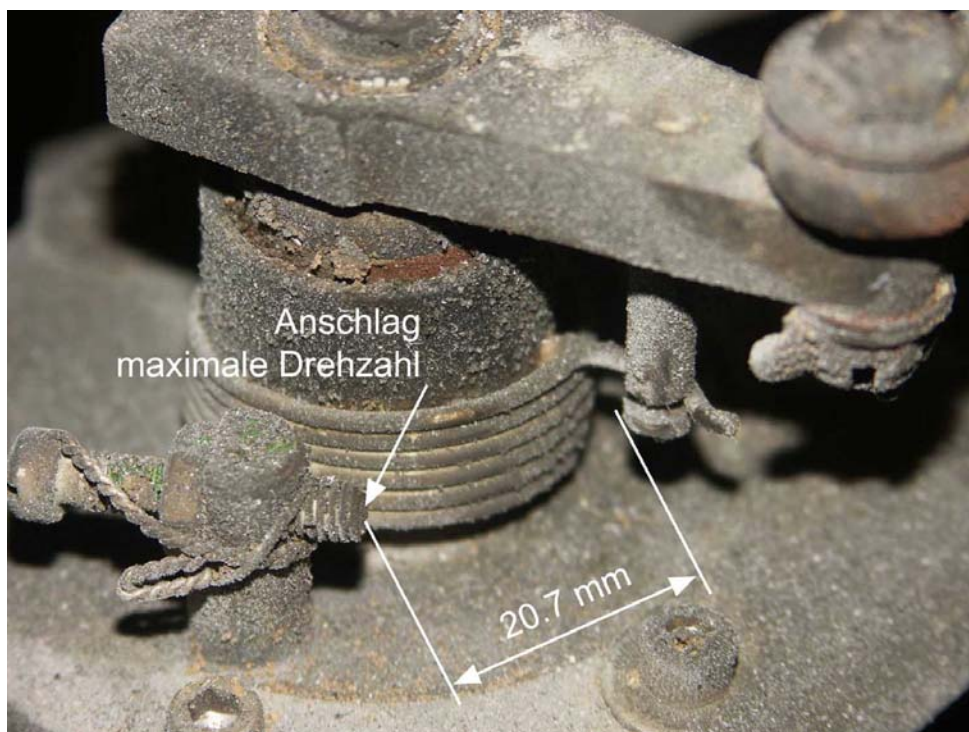
Overview of the condition of the wreck.

## Annex 2



Ref. figure 2.1:

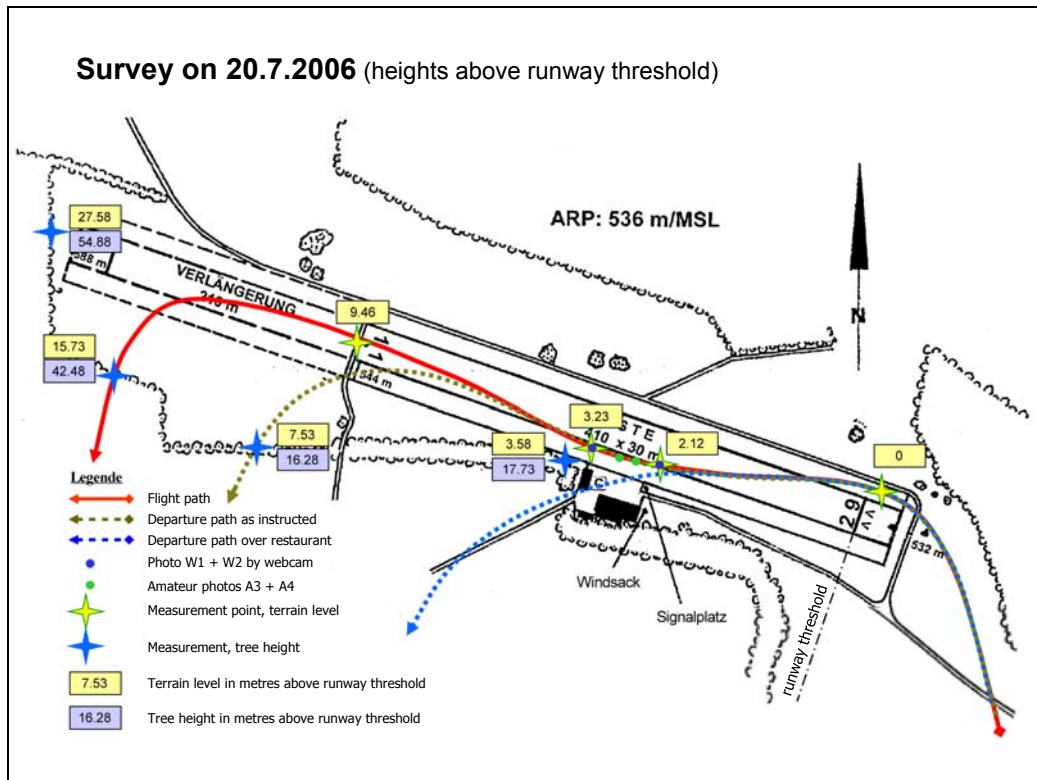
The two stops for maximum and minimum propeller speed.  
(Anschlag minimale Drehzahl = min. speed stop; Anschlag maximale Drehzahl = max. speed stop)



Ref. figure 2.2:

The governor was 20.7 mm from the maximum speed stop, corresponding to a propeller speed of approximately 1800 rpm. It must be assumed that the governor was displaced somewhat by the slight asymmetrical impact.

Annex 3

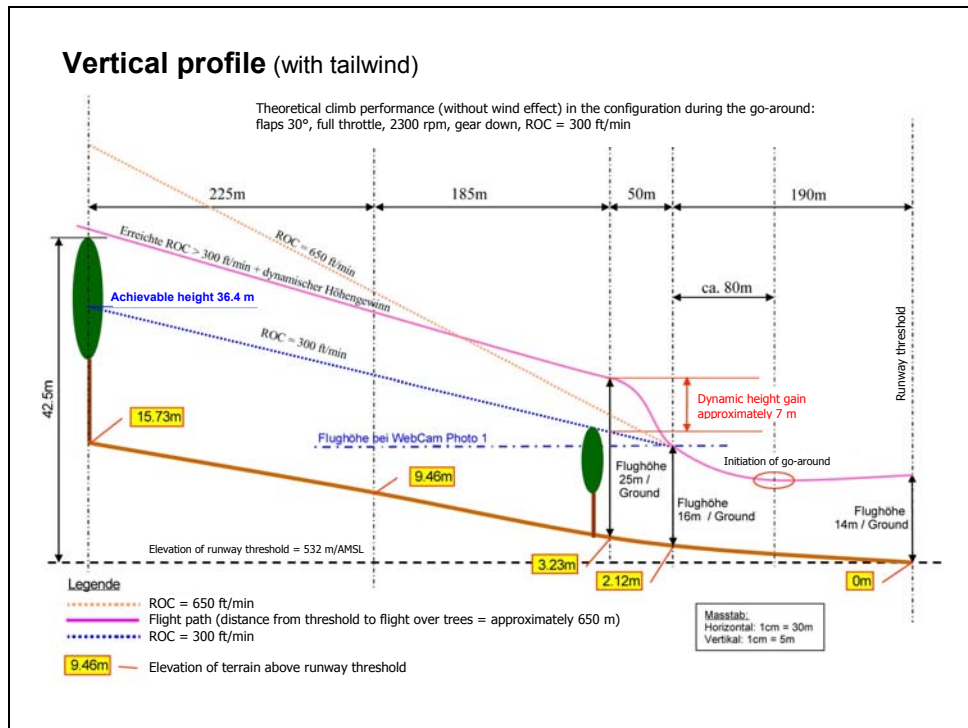


Ref. figure 3.1, terrain survey:

With help of the webcam photos and eyewitnesses, the flight path was reconstructed and points surveyed using a geometer.

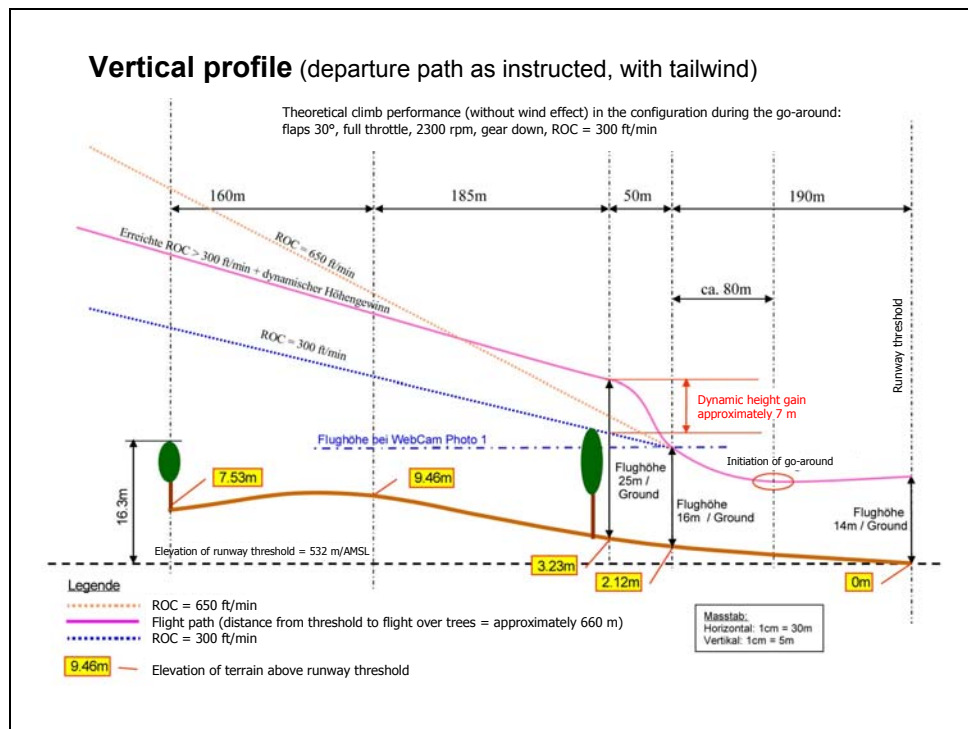
The red flight path was the path involving the accident flight, the yellow flight path was the departure path for a go-around above the lowest obstacles and the blue flight path is the departure path over the restaurant.

Annex 3



Ref. figure 3.2:

The vertical profile shows the accident flight path over the high trees with the average rate of climb of 300 ft/min (for the inappropriate configuration of the aircraft, pink line) and the flight path with the correct aircraft configuration (brown dotted line).



Ref. figure 3.3:

The vertical profile shows the departure path over the lowest obstacles for different rates of climb: the rate of climb of 300 ft/min as flown with the inappropriate configuration would still have sufficed by choosing this departure path.