

Investigation Report

Identification

Type of Occurrence:	Accident
Date:	31 May 2010
Location:	Near Bielefeld
Aircraft:	Airplane
Manufacturer / Model:	Cirrus / SR22
Injuries to Persons:	Pilot and three passengers fatally injured
Damage:	Airplane destroyed
Other Damage:	Crop damage
Information Source:	Investigation by BFU
State File Number:	BFU CX007-10

Factual Information

History of the Flight

On the day of the accident a charter flight according to instrument flight rules from Katowice, Poland, to Bielefeld was planned. According to the flight plan the flight was to be conducted in Flight Level (FL) 100. The plan was to change from Instrument Flight Rules (IFR) to Visual Flight Rules (VFR) north of Oerlinghausen at the reporting point DENOL. Alternate airport was to be Paderborn / Lippstadt Airport. The flight time from Katowice to Bielefeld was to be two hours and 45 minutes.

The Cirrus SR22 took off at Katowice at 0752 hrs¹. In German airspace the flight passed the south of Berlin and continued with a western heading. At 1026 hrs in 4,200 ft AMSL the change of flight rules from IFR to VFR was carried out. At this time the aircraft was about 6 NM east of Bielefeld Airfield. The transponder code was changed to 7000. The pilot selected the heading mode on the autopilot to initially fly to reporting point DENOL.

The Flugleiter (A person required by German regulation at uncontrolled aerodromes to provide aerodrome information service to pilots) at Bielefeld Airfield stated that the pilot radioed for landing on runway 29.

At 1030 hrs the aircraft turned right in the direction of the airfield 2 NM away. During this time the autopilot controlled the descent in the mode VS, ALT SEL, HDG. At 1030:48 hrs the airplane had descended to 1,700 ft AMSL and the autopilot was disengaged.

At 1031:15 hrs the airplane was in about 1,200 ft and about 400 m from the threshold of runway 29. From a heading of 260° the airplane turned left. Within the next 20 seconds the bank angle increased to about 40° and Indicated Airspeed (IAS) fluctuated between 105 kt and 115 kt. At 1031:46 hrs the bank angle decreased to 5° and then increased again. At that time the power lever was selected to 25%. Thereby, IAS decreased from 105 kt to about 77 kt within 10 seconds. At 1031:52 hrs the airplane crossed the extended centre line of runway 29 toward the north. At 1031:57 hrs the power lever was at 100%, the bank angle was about 55° towards the left and the pitch was 15° downward at that time.

Shortly afterwards the airplane impacted a woodland with a high nose down attitude.

Personnel Information

The 26 year-old Pilot in Command (PIC) held a Commercial Pilot's License (CPL(A)), issued in accordance with JAR-FCL and ICAO. Her total flying experience was about 500 hours, about 100 hours of which were flown according to IFR. Her flying experience on the SR22 was about 60 hours. Her class 1 medical certificate was valid to 3 April 2011.

¹ All times local, unless otherwise stated.

The CPL was issued by the responsible Polish authority on 17 September 2008 and valid to 17 September 2013. The pilot held ratings for single-engined and multi-engined aircraft, an instrument rating and an instructor rating.

On 11 June 2009 the pilot had completed the IFR transition training for SR20 and SR22.

Aircraft Information

The Cirrus SR22 is a single-engined, low-wing, fibre composite aircraft with a maximum take-off mass of 1,542 kg. The aircraft with the manufacturer's serial number 3260 was built in 2008 and had since then been operated for about 800 hours. The aircraft had a valid Polish certificate of registration and was operated by a Polish operator.

On 18 May 2008 the last 50-hour inspection was performed.

The Flight Manual, Section 5 Performance Data stipulates stall speeds for different bank angles in relation to the centre of gravity (Appendix 3).

The Cirrus SR22 was equipped with an integrated Avidyne Entegra EXP5000 avionic system. The system consists of a Primary Flight Display (PFD) and a Multi Function Display (MFD). The PFD indicates primary flight data like indicated airspeed, altitude, climb and descent rate, and artificial horizon but is also a navigation system. On the MFD data like engine parameters and maps can be displayed. In addition, two Garmin GNS 430 were installed which, among other things, provided GPS data for the PFD/MFD. The stand-by instruments are located below the PFD. The magnetic compass is installed between windscreen and ceiling.

The airplane was equipped with a Ballistic Recovery System (BRS).

The airplane was certificated for IFR flights.

According to the weighing report of 10 October 2008 the empty mass was 1,113 kg. The weight of the occupants totalled 308 kg. The baggage had a weight of 40 kg.

The operational flight plan found in the cockpit showed that the pilot had planned a loaded block fuel of 92 gallons (348 litres equals 260 kg). The trip fuel was calculated with 42 gallons (159 litres equals 119 kg). Based on the provided documentation a take-off mass of 1,721 kg (3,794 lbs.) was determined. At the time of the accident the mass of the airplane was about 1,603 kg (3,534 lbs).

Meteorological Information

Bielefeld Airfield reported the following weather for the time of the accident:

Surface Wind: 290° / 11 kt
Ground visibility: 7,000 m
Precipitation: light rain showers
Clouds: few in 1,100 ft, scattered in 1,700 ft
Temperature: 10°C
Dewpoint: 9°C
QNH: 1,011 hPa

The alternate airport Paderborn / Lippstadt given in the flight plan reported at 1020 hrs the following weather:

Surface Wind: 270° / 08 kt
Ground visibility: More than 10 km
Clouds: 5/8 in 1,500 ft, 8/8 in 2,200 ft
Temperature: 10°C
Dewpoint: 7°C
QNH: 1,010 hPa

The documentation found in the cockpit show that the pilot had listened to the ATIS information of Paderborn / Lippstadt Airport and wrote it down.

Aids to Navigation

The pilot had a VFR approach chart and an aerodrome chart for Bielefeld Airfield aboard.

The maximum elevation figure according to VFR Aeronautical Chart ICAO 1:500 000 for the Bielefeld area is 2,400 ft AMSL.

Communication

The pilot had radio contact with Bielefeld Info. Communications were conducted in the English language.

Aerodrome information

Bielefeld Airfield has one runway which is 1,256 m long and 20 m wide, oriented 11/29. The landing distance available of runway 29 was 1,040 m. The published traffic circuit runs south of the airfield in 1,400 ft AMSL. Aerodrome elevation is 454 ft AMSL.

Flight Recorders

The radar data was provided to the BFU.

The PFD, the MFD and the Remote Data Module (RDM) installed in the tail record quite a few flight parameters. These include indicated airspeed, altitude, orientation angles, GPS, engine and autopilot data. These components were read-out at the American National Transportation Safety Board (NTSB) and made available to the BFU for analysis.

Wreckage and Impact Information

The accident site was located about 200 m north of the extended centre line and 1 km east of Bielefeld Airfield in a small forest. The airplane rested almost vertically on a tree. The propeller blades were torn off. The front part of the airplane up to the seats was destroyed. Fuel was in the tanks. The wing leading edges were smashed and partially torn open. The rescue system had been deployed. The control handle was unlocked but not pulled.

The examination of the wreckage determined no evidence of technical defects.

In the cockpit maps were found regarding the conducted flight. These included the IFR route chart, visual approach charts, the aerodrome chart for Bielefeld Airfield and the alternate airport Paderborn / Lippstadt and written notes of ATIS reports of Berlin-Schönefeld Airport, Hanover Airport and Paderborn Airport. The VFR Aeronautical Chart ICAO 1:500 000 was not found.



Wreckage overview

Photo: BFU

Medical and Pathological Information

All four occupants were subject to post-mortem examinations. The occupants died due to the injuries suffered during impact. No evidence for physiological impairments of the pilot was found.

During the autopsy the weights of the occupants were determined.

Fire

There was no fire.

Analysis

General

Due to the severity of the injuries, the accident was not survivable. The rescue system had deployed. The position of the control lever showed, however, that the rescue system had been deployed by the impact and not by the pilot.

The findings on the wreckage and the analysis of the flight data revealed no technical deficiencies relevant to the accident. The remaining fuel quantity was not determined.

Based on the flight planning documentation and the manual data it was determined that at take-off the airplane was overloaded by about 179 kg. At the time of the accident the airplane's mass exceeded the maximum take-off mass by 62 kg (3.9%).

Weather

The weather information and the recorded flight altitude indicate that the pilot did not have visual contact with the ground at the time of change of flight rules. The weather data also indicates that until reaching the airfield visual contact with the ground could not have prevailed at all times.

At the time of the accident visual meteorological conditions prevailed at Bielefeld Airfield and at the alternate airport Paderborn / Lippstadt.

Instrument approach procedures were available at the alternate airport Paderborn / Lippstadt.

Flight Operational Aspects

The pilot had the necessary licenses and ratings required for the conduct of the flight. The BFU is of the opinion that the pilot had sufficient flying experience. Considering an IFR experience of 100 hours the pilot was familiar with flights according to instrument flight rules. The flight planning documentation and the notes written during the flight show that the pilot's navigational preparation was sufficient and that she was attentive to the weather during the flight.

At the time of change of flight rules from IFR to VFR the airplane was in 4,200 ft AMSL. The meteorological data show that at the time the pilot did not have visual contact with the ground. Not until the vicinity of the airfield, the pilot was in 1,200 ft and, therefore, below the cloud base.

The BFU is of the opinion that the pilot did not see the runway at that time because of the seating position and the resulting limited view to her right front.

According to the GPS indication she had reached the airfield or the runway, respectively. It is highly likely that the pilot tried to obtain visual contact with the runway by turning with a high bank angle and not move further away from the airfield.

The recorded parameter show that in the last seconds prior to the accident the bank angle increased to up to 60° and the indicated airspeed decreased to 78 kt. Thereby, the speed fell below the stipulated stall speed of 99 kt for a bank angle of 60°.

Conclusions

The accident was due to the following:

- The chosen approach profile led the airplane below the clouds only a short distance prior to the airfield.
- Turning occurred with a high bank angle and thereby speed fell below the stall speed.

Contributing factors were:

- The low cloud base.
- That the pilot did not decide to fly to the alternate aerodrome which would have provided the option of an IFR approach.
- The overload of the airplane.

Investigator in charge: Andreas Wilke

Assistance: Philipp Lampert, Jens Friedemann

Braunschweig: 24 May 2012

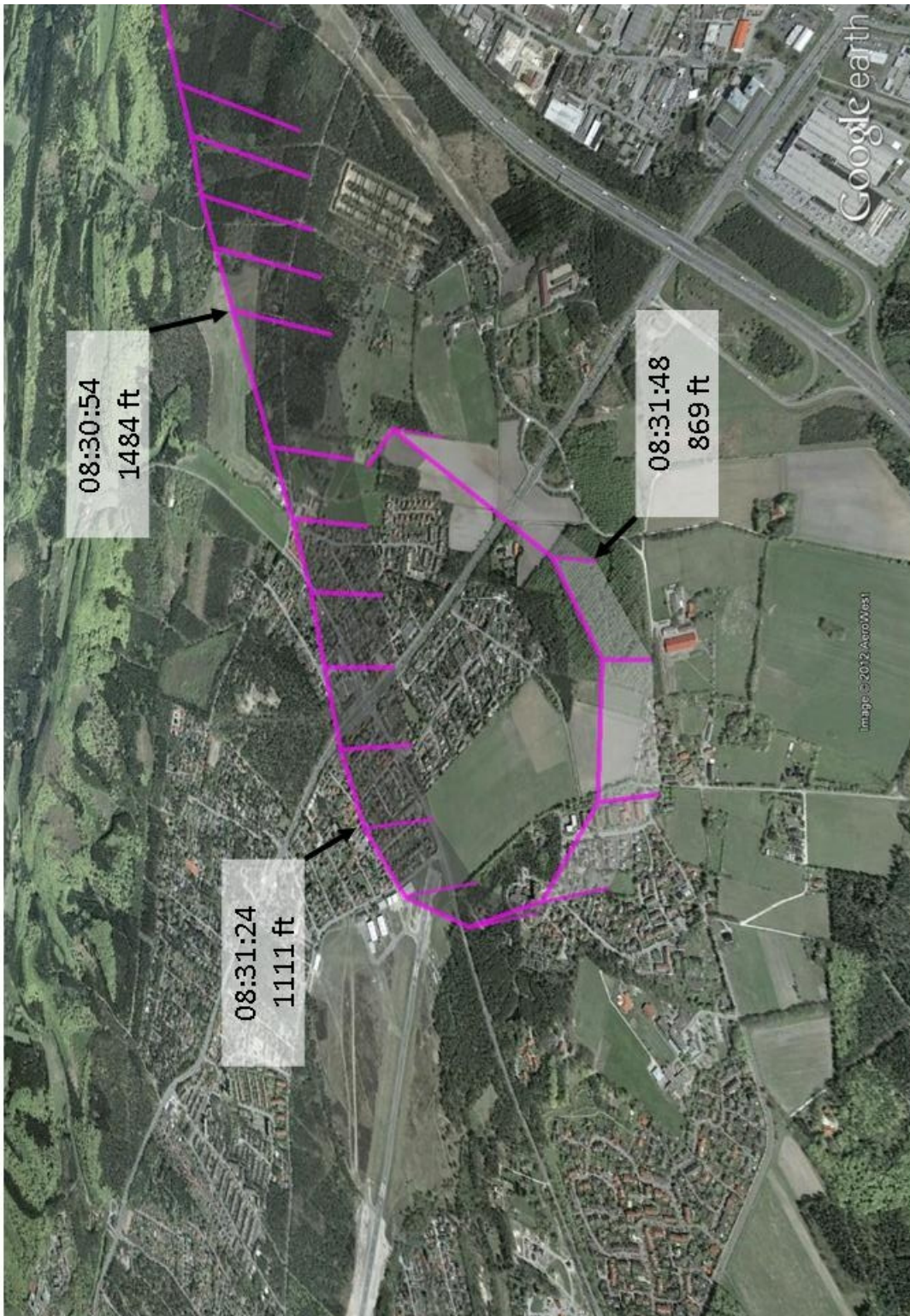
Appendices

Appendix 1 Reconstruction of the flight path

Appendix 2 Fight data

Appendix 3 Excerpt of the flight manual

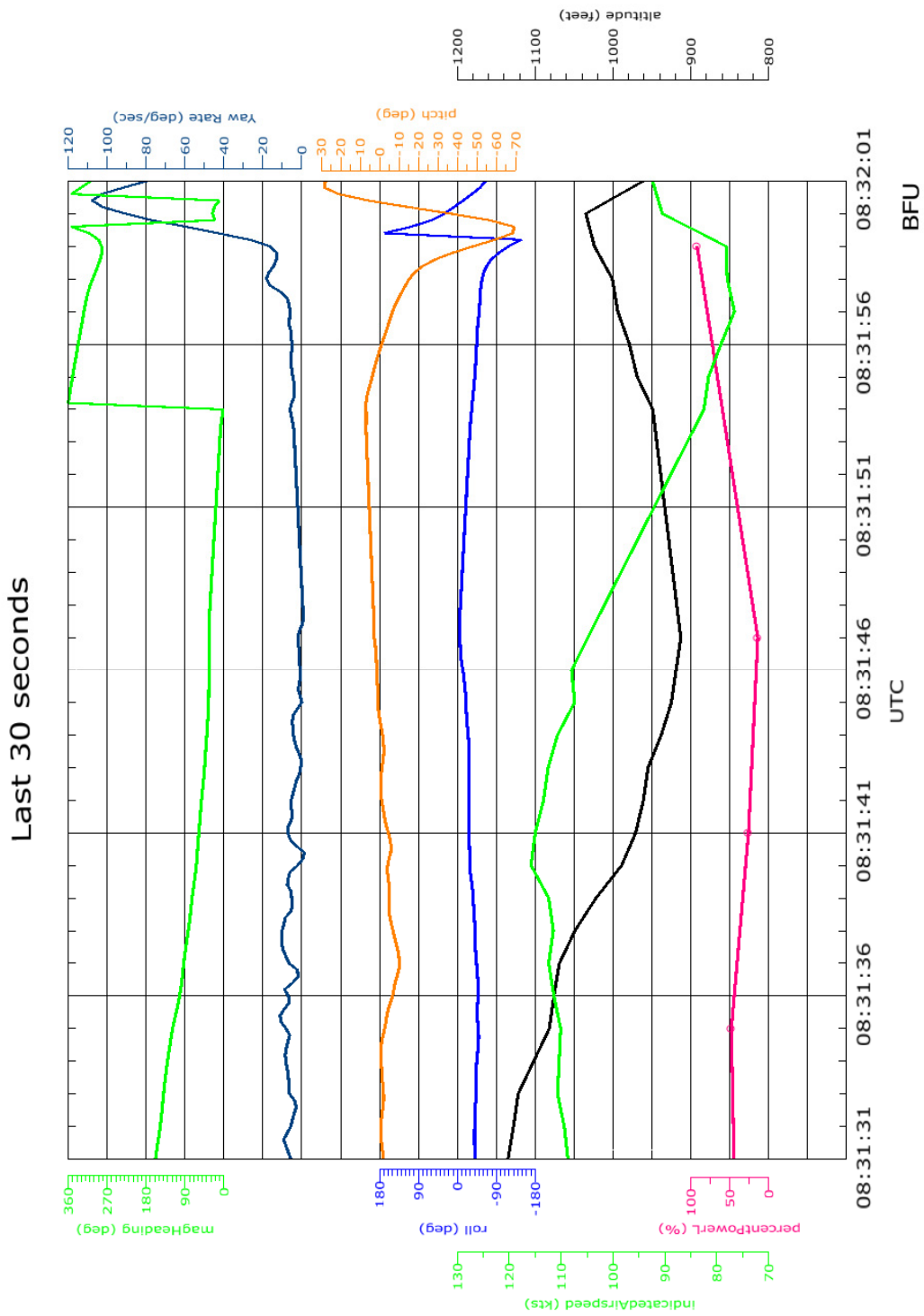
Appendix 1



Reconstruction of the flight path (Times in UTC, altitude in AMSL)

Source: Google-Earth™ / BFU

Appendix 2



Flight data (Times in UTC, altitude in AMSL)

Source: BFU

Appendix 3

 Section 5
 Performance Data

 Cirrus Design
 SR22

Stall Speeds
Conditions:

- Weight 3400 LB
- CG Noted
- Power Idle
- Bank Angle Noted

• Note •

Altitude loss during wings level stall may be 250 feet or more.
 KIAS values may not be accurate at stall.

Weight	Bank Angle	STALL SPEEDS					
		Flaps 0% Full Up		Flaps 50%		Flaps 100% Full Down	
		KIAS	KCAS	KIAS	KCAS	KIAS	KCAS
3400 Most FWD CG	0	73	70	66	64	62	60
	15	74	71	67	65	64	61
	30	76	75	71	69	66	64
	45	83	83	77	76	72	71
	60	99	99	90	90	84	84
3400 Most AFT CG	0	72	69	65	63	60	58
	15	73	70	66	64	61	59
	30	76	74	69	67	63	62
	45	82	82	76	75	69	69
	60	98	98	89	89	82	82

5-10

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 Original Issue

Excerpt of the flight manual

Source: Aircraft Manufacturer

This investigation was conducted in accordance with the regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and the Federal German Law relating to the investigation of accidents and incidents associated with the operation of civil aircraft (Flugunfall-Untersuchungs-Gesetz - FIUUG) of 26 August 1998.

According to the law the sole objective of the investigation shall be the prevention of future accidents and incidents. It is not the purpose of this activity to assign blame or liability or to establish claims.

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German Federal Bureau of
Aircraft Accident Investigation
Hermann-Blenk-Str. 16

38108 Braunschweig

Phone ++49 531 3548-0
Fax ++49 531 3548-246

Mail box@bfu-web.de
Internet www.bfu-web.de