

# FINAL REPORT



ACCIDENT 2022/3010

State Commission on Aircraft Accidents Investigation

UL. CHAŁUBIŃSKIEGO 4/6, 00-928 WARSZAWA | DUTY PHONE (+48) 500 233 233

# FINAL REPORT

## ACCIDENT

OCCURRENCE NO. – 2022/3010

AIRCRAFT – SAILPLANE, ASG-29E, SP-3818

DATE AND PLACE OF OCCURRENCE – 15 JUNE 2022, Lubin (EPLU)



The Report is a document presenting the position of the State Commission on Aircraft Accidents Investigation concerning circumstances of the air occurrence, its causes and safety recommendations. The Report was drawn up on the basis of information available on the date of its completion.

The investigation may be reopened if new information becomes available or new investigation techniques are applied, which may affect the wording related to the causes, circumstances and safety recommendations contained in the Report.

Investigation into the air occurrence was carried out in accordance with the applicable international, European Union and domestic legal provisions for prevention purposes only. The investigation was carried out without application of the legal evidential procedure, applicable for proceedings of other authorities required to take action in connection with an air occurrence.

The Commission does not apportion blame or liability.

In accordance with Article 5 paragraph 6 of the Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation [...] and Article 134 of the Act – Aviation Law, the wording used in this Report may not be considered as an indication of the guilty or responsible for the occurrence. For the above reasons, any use of this Report for any purpose other than air accidents and incidents prevention may lead to wrong conclusions and interpretations

This Report was drawn up in the Polish language. Other language versions may be drawn up for information purposes only.

**WARSAW 2023**

## Table of contents

---

Abbreviations .....	3
General information.....	4
Synopsis .....	5
1. FACTUAL INFORMATION.....	6
1.1. History of the flight .....	6
1.2. Injuries to persons.....	7
1.3. Damage to aircraft.....	7
1.4. Other damage .....	7
1.5. Personnel information (crew data) .....	8
1.6. Aircraft information .....	8
1.7. Meteorological information .....	10
1.8. Aids to navigation.....	10
1.9. Communications .....	10
1.10. Aerodrome information.....	10
1.11. Flight recorders .....	11
1.12. Wreckage and impact information.....	11
1.13. Medical and pathological information .....	12
1.14. Fire .....	13
1.15. Survival aspects.....	13
1.16. Tests and research .....	13
1.17. Organisational and management information.....	13
1.18. Additional information.....	13
1.19. Useful or effective investigation techniques .....	13
2. ANALYSIS.....	13
3. CONCLUSIONS.....	20
3.1. Commission findings .....	20
3.2. Causes of the accident.....	20
3.3. Contributing factors .....	20
4. SAFETY RECOMMENDATIONS .....	20
5. ANNEXES .....	20

## Abbreviations

---

Abbreviation	Meaning in English
A/C	Aircraft
AGL	Above Ground Level
ARC	Airworthiness Review Certificate
ATO	Approved Training Organisation
BFU	German Federal Bureau of Aircraft Accident Investigation
CAA / ULC	Civil Aviation Authority [Poland]
EASA	European Union Aviation Safety Agency
FAI	Fédération Aéronautique Internationale
GPS	Global Positioning System
LMT	Local Mean Time
OPC	Operator Proficiency Check
RWY	Runway
SPL	Sailplane Pilot Licence
TKC	Theoretical Knowledge Check

## General information

Occurrence reference number:	2022/3010			
Type of occurrence:	ACCIDENT			
Date of occurrence:	15 JUNE 2022			
Place of occurrence:	Lubin (EPLU)			
Type and model of aircraft:	Sailplane ASG-29E (ASW-27-18E)			
A/C registration marks:	SP-3818			
A/C User/Operator:	PRIVATE INDIVIDUAL			
Pilot-in-Command:	Sailplane pilot (SPL)			
Number of victims/injuries:	Fatal	Serious	Minor	None
	-0	1	0	0
Domestic and international authorities informed about the occurrence:	ULC, EASA, BFU, EC			
Investigator-in-Charge:	Jacek Bogatko			
Investigating Authority:	State Commission on Aircraft Accidents Investigation			
Accredited Representatives and their advisers:	None designated			
Investigation team:	None designated			
Document containing results:	FINAL REPORT			
Safety recommendations:	None proposed			
Addressees of the safety recommendations:	NONE			
Investigation completion date	16.06.2023			

## Synopsis

---

On 15 June 2022, the Lubin Aerodrome hosted the 12<sup>th</sup> Spring En-Route Flight Training Camp (hereinafter: 12 SERFTC), which involved sailplane flights. At 12:03 hrs,<sup>1</sup> sailplane ASG-29E with competition marks ZB took off. Following release from aerotow at a height of about 600 metres<sup>2</sup> the sailplane initiated a thermal flight. At about 12:30 hrs, when the sailplane was in the area of the first turn at a height of about 200 m, the pilot attempted to start the sustainer engine. The attempt was unsuccessful. While carrying out a turn to land at low height, the sailplane caught on the ground with its wing and subsequently collided with the ground.

The occurrence was reported to emergency services which provided first aid to the pilot upon arrival and subsequently transported him to a hospital in Lubin.

As a result of the occurrence, the pilot suffered serious injuries and the sailplane sustained substantial damage.

The occurrence was investigated by Jacek Bogatko, a PKBWL member.

**In the course of the investigation, the PKBWL established the following causes of the aircraft accident:**

- 1) Lack of decision to abort the flight and land after a failed attempt to climb in a thermal.
- 2) Attempt to start the sustainer engine at a too low height, which caused the pilot to operate under time pressure in the final stage of the flight.
- 3) An attempt to make a 180° turn at a too low height.

**Contributing factors:**

None established.

After completion of the investigation, the PKBWL did not propose any safety recommendations.

---

<sup>1</sup> All times in this Report are provided in LMT; on the day of the occurrence LMT=UTC+2 h.

<sup>2</sup> All heights in this Report are AGL.

## 1. FACTUAL INFORMATION

### 1.1. History of the flight

On 15 June 2022, the Lubin Aerodrome (ICAO code: EPLU) hosted sailplane flying competition as part of the 12 SERFTC organised by the Zagłębie Miedziowe Aero Club. Take-offs were carried out from a grass runway in direction 13. At 12:03 hrs, sailplane ASG-29E with registration marks SP-3818, took off. The pilot planned to carry out a freestyle training flight. Following an aerotow, the pilot released his sailplane at a height of about 600 m and started thermalling in circles above the forest to the north-east of the aerodrome (Figure 1). In circling, the pilot climbed additional 80 m and thereafter started to descend.

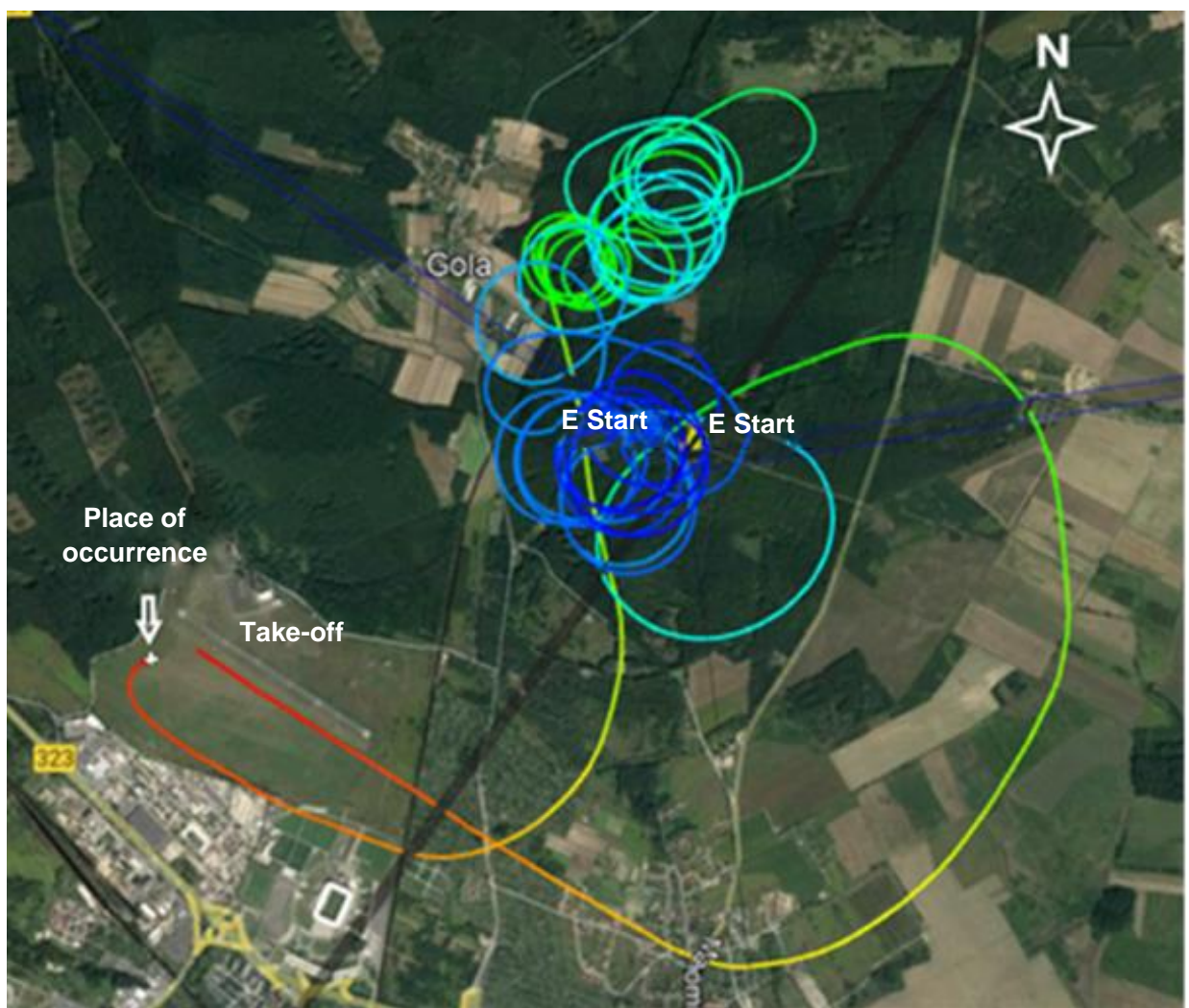


Figure 1. The flight record based on an IGC readout [source: pilot's GPS]

At about 12:30 hrs, when the sailplane was in the area of the first turn at about 200 m AGL, the pilot commenced an unsuccessful attempt to start the sustainer engine. The pilot was flying downwind leg of the right hand traffic pattern. During the turn to final, the sailplane was stalled at a low height. It hit the ground with the right wing and subsequently with the nose section of the fuselage. Moving on the ground for 50 m,

the sailplane spun right for about 180° relative to the direction of the flight (it made a ground loop), and came to a halt.

As a result of the collision, the pilot suffered serious injuries and the sailplane sustained substantial damage (Figure 2).



Figure 2. A photograph of the sailplane after the occurrence [source: Dariusz Deptuła]

The accident was reported to emergency services which provided first aid to the pilot upon arrival and transported him to a hospital in Lubin.

## 1.2. Injuries to persons

Injuries	Crew	Passengers	Others	TOTAL
Fatal	0	0	0	0
Serious	1	0	0	1
Minor	0	0	0	0
None	0	0	0	0

## 1.3. Damage to aircraft

As a result of the sailplane collision with the ground, the nose section of the fuselage, wings and the vertical and horizontal stabilisers were damaged, the tail boom and the propeller brake cable broke (Figure 3).



Figure 3. Damage to the sailplane [source: PKBWL]

## 1.4. Other damage

During the occurrence, the grass surface of the aerodrome was slightly damaged.



### 1.5. Personnel information (crew data)

The sailplane pilot, aged 56, holder of:

- a valid Sailplane Pilot Licence (SPL);
- a valid aeromedical certificate;
- valid TKC and OPC.

As per his statement, the pilot's flight experience on sailplanes was 1,100 FH, and he has flown 140 h over the last 24 months.

During 12 SERFTC, the pilot carried out 5 flights in 13 hours 22 minutes.

### 1.6. Aircraft information

The ASG 29E (ASW 27-18E) is a single-seat high-performance 18-metre FAI Class sailplane with an 18 kW (24 KM) retractable sustainer engine providing for climb rates of up to 1.2 m/s (Figure 4). The wing span can be reduced to 15 metres by changing the wing tips. The wings are fitted with ailerons, flaps, aerodynamic brakes, and winglets. The aileron, aerodynamic brake and flap actuators connect automatically when the wings are being assembled. The sailplane has a retractable landing gear fitted with a hydraulic disc brake. The never exceed speed (Vne) is 270 km/h.



Figure 4. The ASG 29E sailplane [source: W. Ozimek, online: <https://www.jetphotos.com/photo/8165931>, accessed: 01/03/2023]

The sailplane had:

- Certificate of Registration of 26 January 2022;
- Certificate of Airworthiness of 21 March 2012;
- Radio Permit valid until 3 March 2032;
- third party liability (OC) and accident (AC) insurance.

Year of manufacture	Manufacturer	Airframe serial number	Nationality and Registration	No. of registry	Date of entry
2012	Alexander Schleicher GmbH & Co.	29638	SP-3818	3818	26/01/2022

Airworthiness review certificate (ARC): valid until 17 February 2023

Total Time Since New: 1,233 hrs 22 min.  
Total Flights Since New: 342 f  
Flight time since last maintenance or overhaul: 13 hrs 22 min.  
Date of last periodic check: 21/12/2021  
after TTSN: 1,220 hours

Next periodic check – annual inspection.

Engine: SOLO 2350, two-cylinder, two-stroke.

Year of manufacture	Manufacturer	Serial number
2011	SOLO Kleinmotoren	1089

Date of installation on airframe: 2012

Maximum Take-Off Power: 24 HP  
Engine Operating Time Since New: 11 hrs 19 min.  
Date of last periodic check: 21/12/2021  
after TTSN: 11 hrs 19 min

Next periodic check 25 hours or after 12 months.

Propeller: a wooden twin-blade fixed-pitch propeller manufactured in 2021 by Alexander Schleicher Segelflugzeugbau, serial number 2619.

Fuel&Lubricants prior to the flight:

fuel: Pb 95 - 8 litres

Sailplane load:

- empty mass: 339.8 kg
- fuel mass: 6.0 kg
- crew mass: 105.0 kg
- luggage mass: 1.0 kg

Total mass:

- allowable: 600.0 kg
- actual: 451.8 kg

Maximum allowable cockpit load: 109.5 kg.

Actual cockpit load: 106 kg.

## 1.7. Meteorological information

### GAMET

```
FAPL22 KRAK 150900

EPWW GAMET VALID 151000/151600 EPKK-
EPWW WARSAW FIR/A2 BLW FL150

SECN I

HAZARDOUS WX NIL

SECN II

PSYS: 12 H 1022 HPA OVER SE POLAND MOV SE SLW NC
      L 997 HPA OVER LADOGA LAKE MOV NE NC

SFC WIND: 10/16 VRB/02KT
WIND/T:   10/16
  1000FT AMSL VRB/05KT PS18
  2000FT AMSL VRB/05KT PS15
  3300FT AMSL VRB/05KT PS12
  5000FT AMSL VRB/05KT PS07
 10000FT AMSL 300/20KT MS01
CLD:     10/16 NE OF LINE EPZG-EPOP SCT/BKN CU 5000/7500FT AMSL
          10/16 NE OF LINE EPZG-EPOP LCA FEW/SCT AC 9000/11000FT AMSL
          10/16 SW OF LINE EPZG-EPOP LCA SCT CU 5000/7000FT AMSL
FZLVL:   10/16 FM SW PART 10000FT AMSL TO NE PART 8500FT AMSL
```

The pilot did not manage to take advantage of a thermal to gain altitude, which did not affect the final phase of the flight.

## 1.8. Aids to navigation

The sailplane instrument panel has a manufacturer-fitted GPS LX 9000. In addition, the pilot was using a Naviter Oudie IGC NAV-96X throughout the flight.

## 1.9. Communications

The sailplane was fitted with a Becker Avionics GmbH AR 6201 radio and a Garrecht Avionik GmbH VT-01 Mode-S transponder.

The radio was operable during the occurrence, but the pilot did not maintain radio communication.

## 1.10. Aerodrome information

The Lubin Aerodrome (EPLU) – a public aerodrome not subject to certification, managed by the Zagłębie Miedziowe Aero Club (Figure 5).



Figure 5. Lubin Aerodrome (EPLU) [source: PKBWL]

### 1.11. Flight recorders

The sailplane instrument panel has a manufacturer-fitted GPS LX 9000, and during the flight the pilot used a Naviter Oudie IGC NAV-96X, which was damaged as a result of the occurrence (Figure 6).



Figure 6. Flight recorders. On the right is the damaged Naviter Oudie IGC [source: PKBWL]

The course of the flight was recorded by both recorders. The IGC files were saved on SD cards and retrieved.

### 1.12. Wreckage and impact information

During the right turn at a low height, the sailplane was stalled and hit the ground with its right wing. According to witness statements, upon contact with the ground the wing

bent, and then the sailplane, moving left, hit the ground with its fuselage at a speed of about 95.2 km/h (according to the GPS recording). As a result of the collision with the ground, the wings and lower nose part of the fuselage sustained damage, the landing gear door was torn out, the windshield fell off, the tail boom broke and the vertical and horizontal stabilisers were damaged. When disassembling the sailplane, the right wing tip could not be removed. It is likely that the pin fastening the tip to the wing was deformed upon contact of the right wing with the ground.

The following was established on the occurrence site:

- the sailplane moved about 50 m following impact;
- the landing gear lever in the cockpit was in the “retracted” setting (Figure 7);
- the flaps were in the "2" position – a negative deflection angle (Figure 7);
- the fuel valve was open;
- the engine deployment and start lever was in the ON position;
- the ballast tanks contained no water;
- the fuel tank contained 8 l of fuel (Figure 8);
- the fuel in the filter was clean (Figure 8).



Figure 7. Positions of the levers in the cockpit [source: PKBWL]

Figure 8. Fuel level in the fuel tank, and the fuel filter [source: PKBWL]



### 1.13. Medical and pathological information

As a result of the occurrence, the pilot suffered spine injuries.

#### **1.14. Fire**

Fire did not occur.

#### **1.15. Survival aspects**

The pilot wore properly fastened safety belts. After the occurrence, he was pulled out of the cockpit by the emergency services – i.e. fire fighters.

#### **1.16. Tests and research**

IGC files were used to analyse the occurrence.

#### **1.17. Organisational and management information**

The flight was carried out as part of 12 SERFTC organised by the Zagłębie Miedziowe Aero Club.

The Zagłębie Miedziowe Aero Club is an approved training organisation (ATO) and provides Sailplane Pilot Licence (SPL) and Private Pilot Licence (Aeroplane) (PPL(A)) training.

With its status of a public benefit organisation, the Aero Club conducts also social activities, making its premises available for the purpose of various charity events.

The Aero Club includes three specialised sections: aeroplane, sailplane and scale models.

#### **1.18. Additional information**

In accordance with Article 16(4) of Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010,

**The Parties did not submit any comments / submitted comments to the report which were taken into account.**

#### **1.19. Useful or effective investigation techniques**

Standard investigation techniques were applied.

## **2. ANALYSIS**

### **2.1. Pre-flight inspection**

The pilot carried out a pre-flight inspection of the sailplane. During the inspection, he deployed the sustainer engine, checked its locking in the deployed position, bled the fuel system, and retracted the engine.

### **2.2. Analysis of the flight**

After aerotow take-off at 12:03 hrs, the pilot released his sailplane at 575 m AGL and started a thermal flight circling above the forest to the north-east of the aerodrome (Figure 1). Initially (while circling in the thermal), the pilot gained additional 80 m in altitude (Figure 9). He maintained height about 650 m for about 3 minutes and then he started descending. At 290 m AGL, the pilot directed the sailplane towards the

aerodrome and accelerated to 152 km/h, and when at 225 m AGL, he initiated engine start up (Figure 1. START E, Figure 9).



Figure 9. Flight altitude record [source: LX 9000]

The ASG 29E Sailplane Flight Manual (hereinafter: FM) provides information that when starting the sustainer engine a possibility of its start failure must always be taken into consideration. Therefore, the process must be commenced at a safe height to permit retraction of the engine and perform a normal landing. The FM states that the safe height is 400 m. Loss of height during engine start is 100-200 m, and the engine start time is ca. 40 s.

The pilot stated that at a height of about 300 m he directed the sailplane towards the aerodrome, deployed the engine and attempted to start it. When the propeller started rotating, he switched the ignition on and got an impression that the engine was running intermittently, so he was hoping that it would start normal operation.

The pilot commenced the engine starting process at a too low height, contrary to the FM provisions.

According to the FM, the in-flight engine start procedure should be as follows:

1. main switch – on;
2. airspeed below 140 km/h;
3. engine lever – to the EXTRACT position;
4. green LED – on;
5. engine lever – to the DECO position;
6. increase airspeed to 120 km/h;
7. engine lever – to the IGNITION position;
8. wait until the engine start (over 4400 rpm);
9. reduce airspeed to 95 km/h (best climb);

Analysis of the final flight phase of the recording (Figure 10) shows that the pilot commenced deploying the powerplant at 225 m AGL with airspeed of 147 km/h and descent rate of 3.4 m/s and then, until the recorded engine start, the airspeed did not exceed 117 km/h. Upon deployment of the powerplant (about 7 s), when the green LED was on, the pilot should move the engine lever to DECO (decompression) and increase airspeed above 120 km/h to increase the propeller RPM, and only then should he move the engine lever to IGNITION. As shown by the recording, the airspeed was too low for starting up the engine, therefore, the engine did not run properly – it did not reach full power.

After starting the engine, the pilot reduced airspeed to ca. 100 km/h and made several attempts to commence climbing, but was unsuccessful as the engine was not working properly.

The unsuccessful attempts to climb during the flight were described by witnesses as "steep climbs made by the sailplane" (Figure 10).

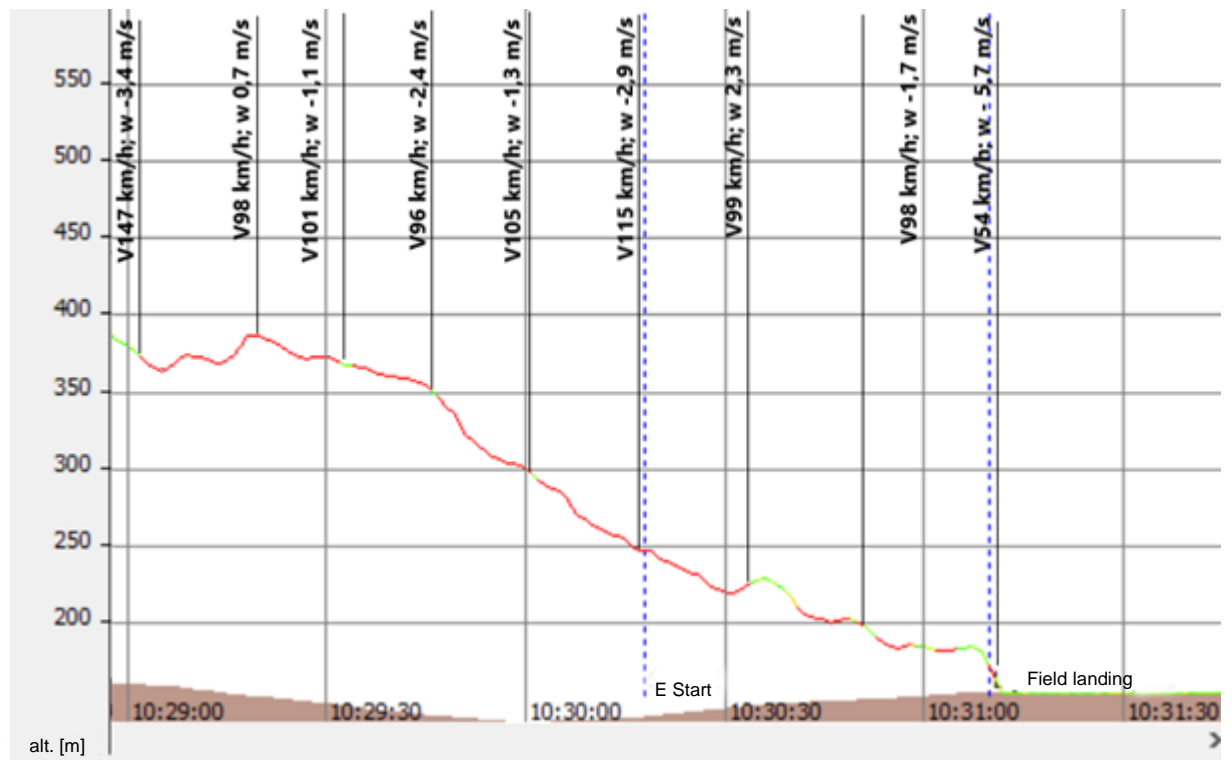


Figure 10. Altitude recording supplemented by airspeeds and rate-of-climb-indicator readouts  
 [source: Naviter Oudie]

As stated by the pilot, the LED on the panel was flashing red after the engine start, which proves that the engine did not start properly. In such a situation, the LED display shows SWITCH E, which the pilot did not read.

During a post-occurrence inspection of the sailplane it was established that the mast on which the engine is mounted had not been extended fully (Figure 11).



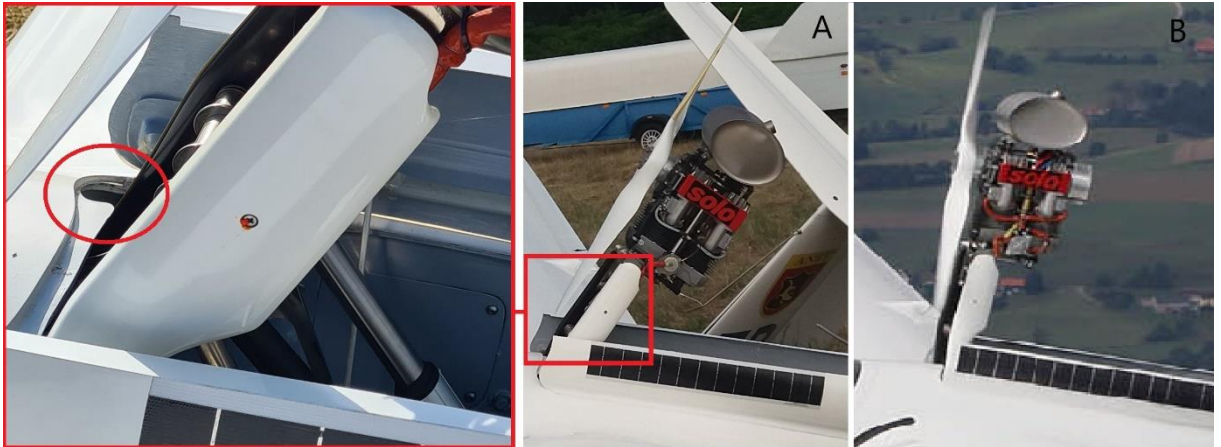


Figure 11. Position of the mast: A: in the accident sailplane after the occurrence, B: correct position [source: PKBWL, Internet]

Inflight photos of the sailplane also show that the mast was not extended fully (Figure 12).



Figure 12. Position of the mast in flight: left – in the sailplane involved in the accident, right – the correct position [source: Dariusz Deptula, Internet]

After an unsuccessful attempt to start the engine and after reading SWITCH E message on the LED panel, the pilot should check the position of the (engine) mast in the mirror. Upon noticing that the mast is not extended properly, the pilot should carry out the procedure provided for such a situation in the FM.

Operating under time pressure, the pilot carried out the engine start procedure too fast and incorrectly.

According to the FM, at about 150 m AGL the pilot should extend the landing gear and set the flaps in the "5" position, changing to "6" in the final phase of the approach (Table 1).

A post-occurrence inspection of the cockpit revealed that the flap lever was in the "2" position and the landing gear lever in the "retracted" position.

Flap position "2" is designed for performing an optimal flight at higher airspeeds. According to the FM, at the actual weight of 451.8 kg, the airspeed range is 143-180 km/h, whereas flap position "5" is for flying at airspeeds below 93 km/h (Figure 13).

Flap Setting	L	6	5	4	3	2	1
Flap deflection	47°/12°	24°/22°	20°/19°	12°/11°	5°	0°	-2,5°
Description	Landing	Circling	Circling	Neutral	Gliding	Gliding	Gliding

Table 1. Flap deflection angles [Source: FM]

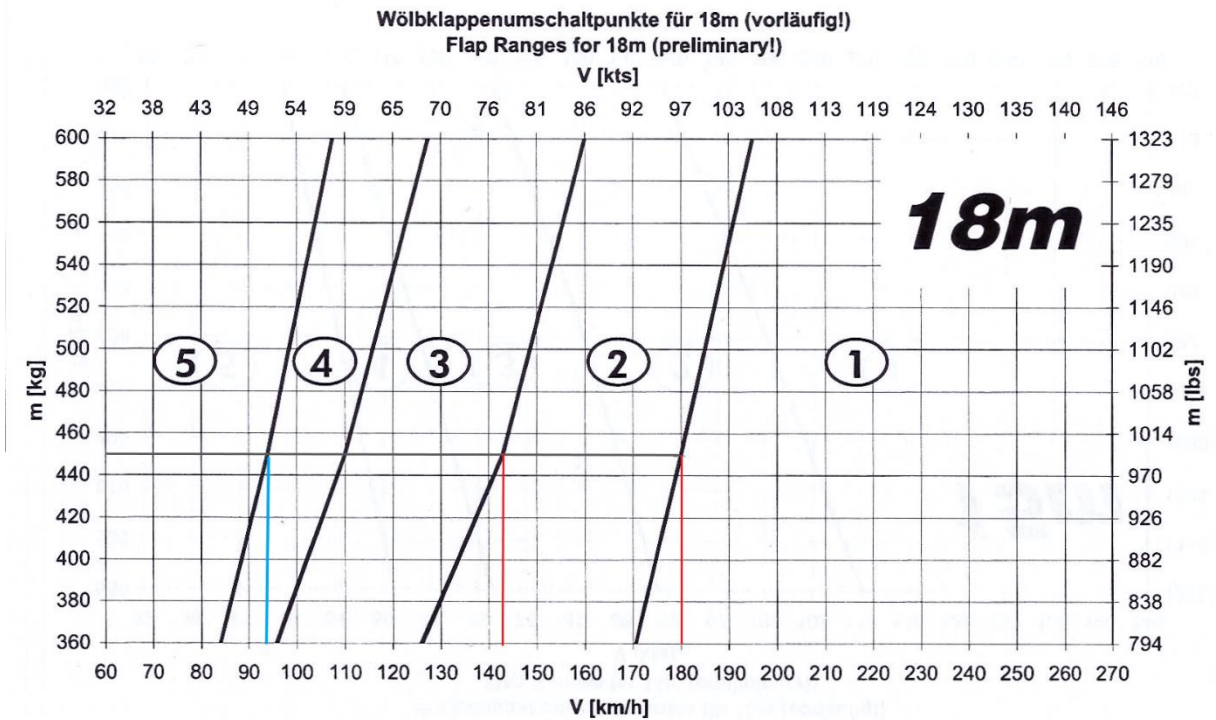


Figure 13. A chart showing recommended flap settings in a straight flight, depending on the sailplane mass [source: FM]

It must be noted that with the flaps set at "2", the minimum (stall) airspeed is greater than in position "5". It is likely that if the flaps had been set at "5", the sailplane would not have been stalled in turn.

It is likely that if the pilot had extended the landing gear, the wheel would have damped the force of impact on the ground. The injuries suffered by the pilot and the damage sustained by the sailplane would have been lesser.

As stated by the pilot, he had not prepared for landing because he was hoping that the engine would start running correctly.

The pilot did not configure the sailplane (did not prepare) for landing.

In that situation, when the sailplane was at about 200 m AGL, the pilot should have informed the flight coordinator by radio that he was intending to land from a thermal flight, specifying the intended landing manoeuvre.

The pilot could have performed the landing approach either by flying along the northern side of the aerodrome and bringing the sailplane on final for landing on RWY 13 (Figure 14, section A) or by landing downwind in the direction of RWY 31 (Figure 14, section B).

When the sailplane was flying downwind (at about 50 m AGL, and the engine was running incorrectly, the pilot still had time to make a decision to land downwind with the power plant deployed (Fig. 14, section C). To do that, he could have set the engine start lever to DECO to shutdown the engine and land with a windmilling propeller. Had the pilot made that decision, he would have ca. 1 km of ground within the aerodrome limits in direction 31 at his disposal (partially beyond designated runways).

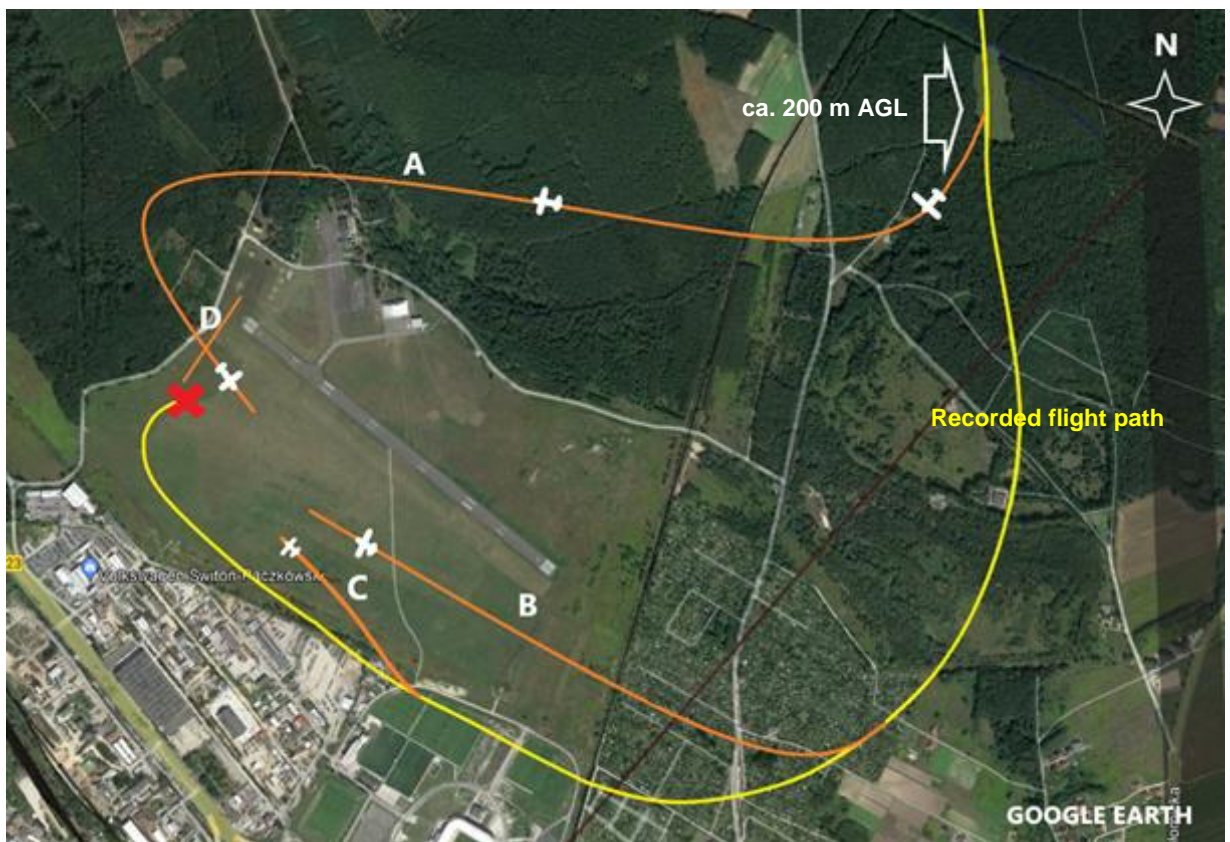


Figure 14. Recorded flight and possible safe approach options [source: PKBWL]

The pilot commenced a 180° turn for landing at a height of about 30 m (Figure 15). Until the impact, the airspeed in turn decreased from 108 km/h to ca. 95 km/h. During the turn, the sailplane was stalled, slid down on the right wing, which hit the ground. The wing was bent and, with a spring reaction, threw the sailplane up. Subsequently, the sailplane hit the ground with its fuselage and tail. As a result of the impact, the tail boom broke and the sailplane spun ca. 180° and moved ca. 50 m (Figure 16).



Figure 15. The final phase of the flight and the sailplane after the occurrence [source: Dariusz Deptuła]

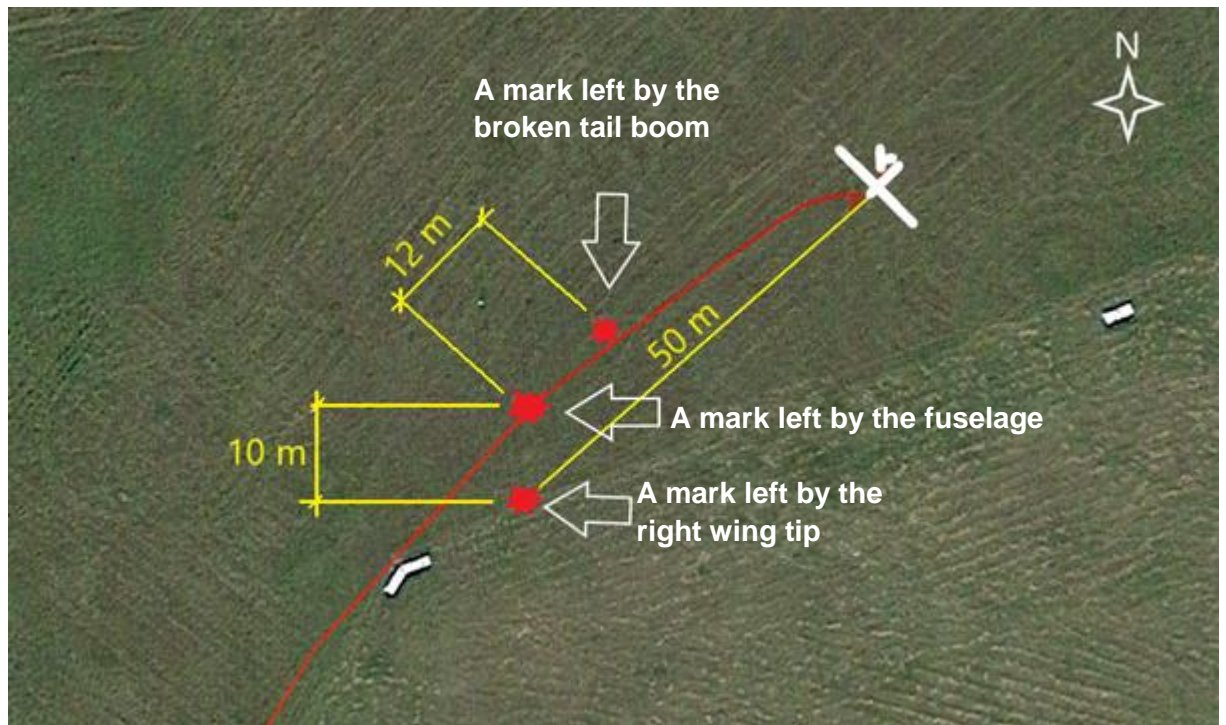


Figure 16. A sketch of the occurrence site [source: PKBWL]

Performing a 180° turn at a height so low, and with the power plant deployed (which had an air brake effect), was bound to be unsuccessful. After a 90° turn, the pilot could have landed across the aerodrome (Figure 14, section D). Then, he would have ca. 350 m of the ground beyond the aerodrome's usable area at his disposal. It is likely that the effects of such landing would have been less serious.

### 3. CONCLUSIONS

#### 3.1. Commission findings

- 1) The pilot had the required qualifications to perform the flight.
- 2) The sailplane had documents required to fly.
- 3) The sailplane was insured.
- 4) The sailplane was equipped with navigational aids.
- 5) The radio was operable during the occurrence, but the pilot did not maintain communication.
- 6) The sailplane was equipped with flight recorders.
- 7) The sailplane moved ca. 50 m following impact.
- 8) The landing gear lever in the cockpit was in the "retracted" position.
- 9) The flaps were in the "2" setting.
- 10) The fuel valve was open.
- 11) The engine deployment and start lever was in the ON position.
- 12) The ballast tanks contained no water.
- 13) The fuel tank contained 8 litres of fuel.
- 14) The fuel in the filter was clean.
- 15) The pilot wore properly fastened safety belts.
- 16) The pilot carried out a pre-flight inspection of the sailplane.
- 17) The pilot commenced the engine start process at a too low height.
- 18) Operating under time pressure, the pilot carried out the engine start procedure too fast and incorrectly.
- 19) The pilot did not configure the sailplane for landing.
- 20) As a result of the occurrence, the pilot suffered serious injuries.
- 21) As a result of the occurrence, the sailplane sustained substantial damage.

#### 3.2. Causes of the accident

- 1) Lack of decision to abort the flight and land after a failed attempt to climb in a thermal.
- 2) Attempt to start the sustainer engine at a too low height, which caused the pilot to operate under time pressure in the final stage of the flight.
- 3) An attempt to make a 180° turn at a too low height.

#### 3.3. Contributing factors

None established.

### 4. SAFETY RECOMMENDATIONS

None proposed.

### 5. ANNEXES

None.

---

**END**

*Investigator-in-Charge*

.....

*(signature on original)*