



ÚSTAV PRO ODBORNĚ TECHNICKÉ ZJIŠŤOVÁNÍ  
PŘÍČIN LETECKÝCH NEHOD  
Beranových 130  
199 01 PRAHA 99

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**Č.j.:154/05**  
Copy No.: 5

# **FINAL REPORT**

**The investigation of accident  
sailplane SZD-48, JANTAR-STANDARD 2,  
registration mark HA-4494,  
NE of airport Šumperk 30.4.2005**

**Praha  
September 2005**

## The parties of The Final Report

### A) Introduction

Operator:	Pilot of the sailplane
Manufacturer:	Przedsiębiorstwo doswiadczalno-produkcyjne Szybownictwa, PZL – Kielsko, Poland
Model of Aircraft:	SZD-48, JANTAR-STANDARD 2
Registration mark:	HA-4494
Place of event:	N49:58:12,5, E17:03:31,5, NE of airport Šumperk
Date:	30.4.2005
Time:	15:47 Central European Summer Time

### B) Synopsis

On 30.5.2005 Air Accidents Investigation Institut of the Czech Republic received an accident report of a plane SZD - 48, registration mark HA - 4494. Based on the report, an investigation into the accident got started.

The cause of the accident was investigated by AAI commission made up of:

Investigator in-charge:	Josef Procházka
Investigator:	Milan Pecník

### C) The Main part of the Final Report contains

- 1) Factual information
- 2) Analysis
- 3) Conclusions
- 4) Safety recommendations
- 5) Appendices ( with copy No. 1, registry AAI CZ)

The Final Report was issued 2<sup>nd</sup> August 2005 by:  
Air Accidents Investigation Institut  
Beranových 130  
199 01 Praha 99  
Czech Republic

## 1. FACTUAL INFORMATION

### 1.1 History of the flight

The flight was organized at the Šumperk Airport (355 m above sea level) on the occasion of sparing-flyers competetion. The planned route: Town of Šumperk, village of Mravenečník by Loučná nad Desnou, village of Polička, town of Šumperk.

The aero-tow flight took-off from the Šumperk Airport (LKSU), release took place in airspace north of the village of Brníčko. The flight route was as follows: mountain of Dražník, hill of Malínský vrch, village of Mladoňov, village of Třemešek (circling), hills of Jestřáb and Volyň, flight over the Šumperk Airport to the eastern border of town of Šumperk, turn right over the Šumperk Airport to the valley in forest massif of

Kamenný vrch hill (952 m above sea level) and Troustice hill (645,5 m above sea level). The flight height had a falling tendency the last nine minutes especially. Over the village Krásné pilot turned left about 390° from the original heading to get to this airspace. In this manoeuvre the sailplane took an unusual position which the pilot was unable to put right due to too low high.

The sailplane fell at an angle of 90°-100° onto a local road, banked slightly left, killing the pilot.

## 1.2 Injuries to persons

Injurie	Crew	Passengers	Others
Fatal	1	0	0
Serious	0	0	0
Minor/None	0	0	0

## 1.3 Damage to aircraft

Destroyed.

## 1.4 Other damage

NIL

## 1.5 Personnel information

Pilot – age:	19
Valid category rating for sailplane pilot	
Valid category rating for private pilot	
Valid medical certificate	
Total flying hours on sailplan:	156 hr 04 min
Total flying hours on the type:	52 hr 26 min
Total SEP flying hours:	64 hr 04 min

He made the last flight as sole-occupant pilot on a sailplane SZD-48 Standard on 23<sup>rd</sup> August 2004. Between that flight and the critical one he flew once an L-13 Blaník glider for 42 minutes with instructor on 10<sup>th</sup> April 2005.

Apart from these sailplane flights he made training flights on a Cessna C -172 plane on the following days:

31. 8.2004	7 flights, 1 hr 35 min with instructor,	4 flights, 25 min alone
1. 9.2004	6 flights, 4 hr 27 min with instructor	
15. 9.2004	1 flight, 5 min with instructor,	2 flights, 1 hr 15 min alone
10.10.2004	2 flights, 10 min with instructor,	3 flights, 1 hr 50 min alone
12.10.2004	1 flight, 40 min with instructor,	
4.11.2004	5 flights, 1 hr 58 min with instructor	
7. 4.2005	6 flights, 1 hr 5 min with instructor,	3 flights, 25 min alone

## 1.6 Aircraft information

Type: SZD 48 Jantar Standard 2  
Date of production: 1978  
Number of flights: 486  
Total flying hours: 1504 hr 30 min  
Valid airworthiness certificate issued by Hungarien Aviation Authority  
Valid registration certificate of the sailplane

On 26 April 2005 an inspection of the sailplane was carried out at the manufacturer in accordance with maintenance program after 100 hours flown. At the same time rudder control cables were changed and board instruments checked.

## 1.7 Meteorological situation

Analysis of the weather (professional estimation of the probable weather in site of the accident) on 30 April 2005 1430 UTC (1630 CEST - Cetral European Summer Time)

Situation: Indistinctive ridge of high pressure coming in Bohemia from north  
Wind: 2,000 ft, 330°/04 kt , +14°C, 5,000 ft, 010°/06 kt, +07°C  
Visibility: Over 10 km  
Weather: Somewhat cloudy without precipitation  
Cloudiness: SCT CU 2500/8000 ft AGL  
Turbulence: Slight thermic  
Ice: NIL

Statemant from the SYNOP reports at the Šerák meteorological station on 30 April 2005 1200 – 1500 UTC ( 1400 – 1600 CEST )

Units used: N – coverage in eights, WS – in knots, VIS in km, cloud height in feet, temperature in degrees Celsius.

Day/UTC/CEST	N	WD/WS	VIS	CLD	T/DP
30/12/14	7	VRB 4	30	3 CU 2000 5 AC 7000	8,9/4,0
30/13/15	6	340°/4	30	5 CU 2100	9,3/3,9
30/14/16	4	VRB 2	30	4 CU 2300	1,5/3,9
30/15/17	4	VRB 2	30	4 CU 2500	10,2/4,0

## 1.8 Aids to navigation

NIL

## 1.9 Communications

No effect on the accident.

## 1.10 Aerodrome information

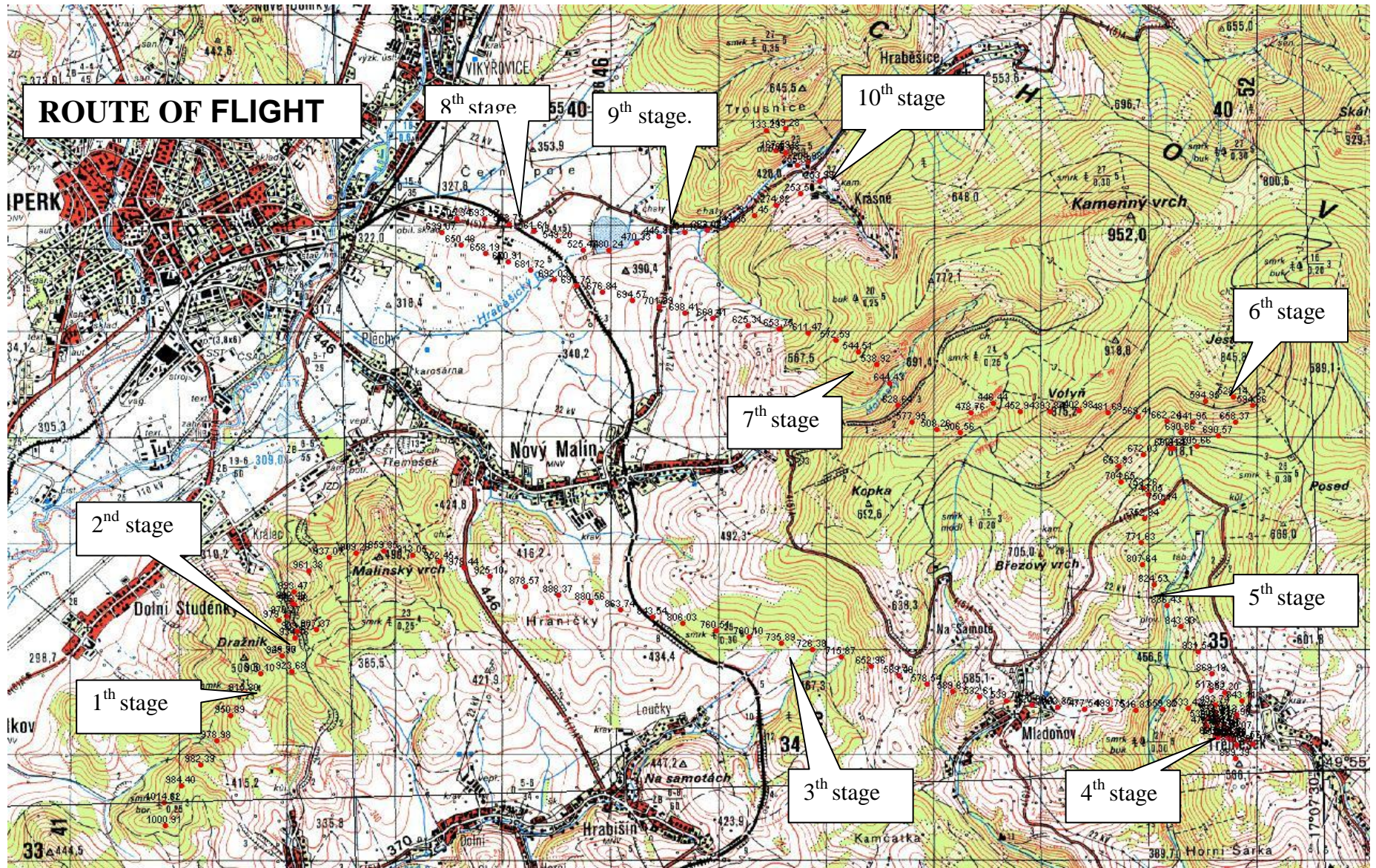
The Šumperk Airport is a public, domestic airport run by Aeroclub Šumperk o.s.

## 1.11 Flight recorders

The sailplane had no flight recorder.

Readouts from GARMIN GPS V navigation device and FUESS barograph were used to evaluate the situation.

The flight time starting from GARMIN V recorder switch-on till the crash was 26 min 40 sec. This time is possible to divided as follows :



### 1<sup>th</sup>. stage

- switch-on GPS - circling NE hill of Dražník, t 1 min 20 sec:  
course 358° - 051,° altitude 4695 - 4649 ft, GS 77 - 101 kmh<sup>-1</sup> min 923 m AGL

### 2<sup>nd</sup>. stage

- 3x turn about 360°, t 2 min:  
NE hill of Dražník, altitude 4651 - 4577 ft, GS 56 - 96 kmh<sup>-1</sup> min 937 m AGL

### 3<sup>th</sup>. stage

- flight NE hill of Dražník – Třemešek, t 5 min 20 sec:  
course 056° - 112°, altitude 4600 - 3408 ft GS 84 - 121 kmh<sup>-1</sup> min 516 m AGL

### 4<sup>th</sup>. stage

- 11x turn about 360°, t 4 min 50 sec:  
village of Třemešek, altitude 3449 - 4679 ft GS 23 - 77 kmh<sup>-1</sup> min 517 m AGL

### 5<sup>th</sup>. stage

- flight Třemešek – hill of Jestřáb, t 1 min 40 sec:  
course 328° - 012°, altitude 4643 – 4445 ft GS 77 – 102 kmh<sup>-1</sup> min 653 m AGL

### 6<sup>th</sup>. stage

- 2x turn about 360°, t 2 min 30 sec:  
hill of Jestřáb, altitude 4509 – 4550 ft GS 56 – 90 kmh<sup>-1</sup> min 528 m AGL

### 7<sup>th</sup>. stage

- flight hill of Jestřáb - Šumperk, t 5 min 30 sec  
course 210°.- 341°, altitude 4525 – 3304 ft GS.73 – 122 kmh<sup>-1</sup> min 393 m AGL

### 8<sup>th</sup>. stage

- Šumperk – right turn to lake\*, t 1 min 20 sec  
course 103° - 092°, altitude 3265 – 2912 ft GS 70 – 90 kmh<sup>-1</sup> min 525 m AGL

### 9<sup>th</sup>.stage

- lake\* – village of Krásné, t 1 min 30 sec  
course 058° - 084°, altitude 2498 – 2326 ft GS 78 – 95 kmh<sup>-1</sup> min 253 m AGL

### 10<sup>th</sup>.stage

- manoeuvre – village of Krásné (time interval 10 sec)

course :	329°	297°	000°	266°	156°	126°	035°
altitude [ ft ]:	2311	2251	2276	2262	2282	2303	2309
GS [kmhod <sup>-1</sup> ]:	77	81	79	65	76	86	50
AGL [ m ]:	253	204	161	119	133	167	255

\* lake 2 km E of airport Aeroclub Šumperk ( next lake only.)

## 1.12 Wreckage and impact information

The place of accident was the local road with concrete surface between the villages of Krásné and Hraběšice, district of Šumperk.

The sailplane first touched the ground with its left wing angled 090° - 100°, heading 160° - 180° on a slope 1-1,5 m from the east edge of the road. Then the sailplane fell on the ground, its front part ahead. The front part up to the wing leading edge was destroyed by the shock, tailplane surfaces were broken off and the other parts of the sailplane were damaged in various ways.

When inspecting the wreckage, no malfunction of control rods from the wing leading edge to the control surfaces was found. It was not possible to ascertain the status of the controls in the sailplane's front part due to the damage sustained.

The sailplane's water tanks had not been filled before the flight.

### **1.13 Medical and pathological information**

The pilot was not affected by alcohol or forbidden drugs during the flight.

At the pilot's complex examination there found no:

- facts indicating a medical cause of the accident
- injury changes that could not be accounted for by the accident

### **1.14 Fire**

NIL

### **1.15 Search and rescue**

No search was organized. Ambulance and fire brigádě were called by a witness.

### **1.16 Tests and research**

NIL

### **1.17 Organizational and management information**

NIL

### **1.18 Additional information**

In looking into accident cause an eye witness from the town of Šumperk was questioned. He said, he was not active in flying, but his hobby was watchig air traffic at the Šumperk Airport and he went there very often.

He shoved the sailplane's final manoeuvre on aircraft model.

At the time of the accident the witness was 1 – 1,5 km S from the place over which the sailplane circled. In a left turn the sailplane passed to a high-pitched descent spinning irregularly on all three axes. The witness estimated the initial height of this manoeuvre at 300 to 400 m above ground level. The pilot pulled out, but with nose up at very low forward speed the sailplane began similar manoeuvre again. The witness did not see the flight final phase as the plane crashed behind a terrain obstruction.

On being asked some skilled pilots who flew this type of plane, they said that the sailplane is suitable for experienced pilots. They pointed out a characteristic quality of the sailplane in yaw to start a spin or a fall without warning. The SZD-48 Jantar Standard flight manual states in Art. 4.5.3. in note „The sailplane does not warn before stalling!”. „The stall in circling shows in the tendency to reduce the radius of circling and signs of speedometer vibrations.“ The Art 4.5.5. reads further „Circling with minimum airspeed requires the stronger attention – see item 4.5.3. – Stalling.

### 1.19 Useful or effective investigation techniques

The investigation has been led in accordance with Annex 13.

## 2. ANALYSIS

The pilot took part in a concentration training of soaring flyers at the Šumperk Airport. On that day it was his first solo flight on this type after more-than-eight-month break.

The take-off was through the air-tow flight, starting at 14:48 CEST.

The pilot switched on the GARMIN V radionavigational aid 15:20:30 CEST at an altitude of 4,714 ft N of Brníčko village.

The user set the GPS record to the time priority with point recording after 10 sec. From the moment the GPS was switched on, it worked full time during the flight.

Only one route was planned in GPS (RTE), Šumperk (LKSU), village of Mravenečník u Loučné nad Desnou, Polička, Šumperk (LKSU).

FUESS Barograph worked from the start on for the whole flight time.

The total flight time from take-off to crash was 58 min 30 sec according to barograph. The flight time from GARMIN V recorder switch-on to the crash was 26 min 40 sec.

The flight stages 1 to 6, from the time GARMIN V switched on to taking the route from Jestřáb Hill to Šumperk, were executed with small height losses during every stage and with gaining or maintaining height at circling. The absolute height of this part of flight was always more than 517 m. At the time the pilot had an absolute en-route elevation above obstacles up to a distance of more than 5 km.

The flight stages 7 to 8, from Jestřáb Hill to the pond were executed in descent while the short altitude rise by 46, 82, 27 and 19 ft was due to airspeed drops by 9, 16, 30 and 12 kmh<sup>-1</sup>. When flying over the Volyň Hill, which took around 1 min, the absolute height dropped to 393 m, varying from 506 m to 692 m for the other parts of the flight. In stage 8 the pilot gradually changed the heading to fly to the valley between the slopes of Kamenný vrch Hill and Rousnice Hill.

The flight stage 9, from the pond to the small village Krásné, taking 1 min 30 sec, saw a descent of 172 ft ( i.e. with vertical rate of 1,91 ftsec<sup>-1</sup> ). At this stage the flight absolute altitude dropped to 253 m due to elevating land.

Stage 10 ran in the valley Kamenný vrch Hill and Rousnice Hill with the absolute altitude from 119 m to 255 m. In the register land of village of Krásné there is quarry over which, according to local soaring foyere, one experiences rising air flows in sunny weather. The crash site is in its close vicinity.

## 3. CONCLUSIONS

- Pilot was type-rated and with valid medical certificate
- Pilot took part in preflight preparation
- Weather was good for the flight
- Sailplane had been checked after 100 flying hours
- Pilot's decision to make a descent flight to the valley was not correct, taking into account his experience and accumulated flying hours
- Pilot failed to pull out the sailplane when flying in uncommon phase of flight



- for him and too low
- Pilot's flight training was not sufficient for the flight
  - Defects on sailplane's controls, if any, could not be determined as the forward fuselage was destroyed

#### **4. SAFETY RECOMMENDATION**

At public show and competitions the pilot's capabilities should be properly evaluated in compliance with Directive CAA-SLP-001-0/05 Conditions for Arranging Public Airshows and Competitions. In Point 6.4.2. „ the flight manager shall take into account the skill and capability of each competitor with regard to their task, weather condition, aircraft performance and have to give consent to the flight.

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Josef Procházka  
Investigator in-charge

Praha 23.8.2005

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Pavel ŠTRŮBL  
Director AAI