

*The original of the Final Report was issued in the Slovak language.
In case of inconsistency original version in Slovak language is applicable.*



MINISTRY OF TRANSPORT, CONSTRUCTION
AND REGIONAL DEVELOPMENT
OF THE SLOVAK REPUBLIC



AVIATION AND MARITIME INVESTIGATION AUTHORITY
Námestie slobody 6, P.O.BOX 100
810 05 Bratislava 15

FINAL REPORT

on investigation of accident
of glider type **Cirrus VTC**
Registration No. **OM-2908**

Reg. No: **SKA2015003**

The investigation of occurrence has been conducted pursuant to Art. 18 of the Act No. 143/1998 on Civil Aviation (Civil Aviation Act) and on Amendment of Certain Acts and in accordance with the Regulation (EU) No. 996/2010 of the European Parliament and of the Council on investigation and prevention of civil aviation accidents and incidents, governing the investigation of civil aviation accidents and incidents.

The final report is issued in accordance with the Regulation L 13 that is the application of the provisions of ANNEX 13 Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation.

The exclusive aim of investigation is to establish causes of accident, incident and to prevent their occurrence, but not to refer to any fault or liability of persons.

This final report, its individual parts or other documents related to the investigation of occurrence in question have an informative character and can only be used as recommendation for the implementation of measures to prevent occurrence of other accidents and incidents with similar causes.

A. INTRODUCTION

Operator / Owner:	Zuzana Hrnčířiková
Type of operation:	general aviation / sport and recreational flying
Type of glider:	Cirrus VTC
Registration No:	OM-2908



Take-off site:	Airport Trnava / LZTR
Flight phase:	manoeuvring
Place of accident:	1.84 km north-west of the threshold of grass runway 14 ("RWY14") N 48° 28' 18", E 017° 30' 47"
Date and time of accident:	06.06.2015, 15 h 35 min

B. INFORMATIVE SUMMARY

On 06.06.2015, during the first flight following a general overhaul, the glider type Cirrus VTC, Registration No. OM - 2908 (hereinafter "glider") crashed in the landing approach phase after an unintentional left-hand spin. Having stopped the spin rotation in the steep dive phase low above the ground the pilot decided to solve the situation by field landing in the direction of the glider. After this manoeuvre the glider came into slipping contact with the ground.

The following commission was appointed for investigation of the air accident:

Ing. Igor BENEK – chairman of the investigation commission
Ing. Juraj GYENES – member of the investigation commission

The report is issued by:

Aviation and Maritime Investigation Authority
of the Ministry of Transport, Construction and Regional Development of the Slovak Republic

C. MAIN PART OF REPORT

1. FACTUAL INFORMATION
2. ANALYSES
3. CONCLUSIONS
4. SAFETY RECOMMENDATIONS

1. FACTUAL INFORMATION

1.1 History of the flight

On 06.06.2015 the pilot with assistance of other people assembled the glider following a general overhaul (3,000 hour revision and varnish replacement). After the pre-flight inspection the pilot conducted the aero-tow takeoff at 14:24 from RWY14 of aerodrome LZTR and headed to an altitude of 700 m AMSL (above mean sea level). Following disconnection he continued the flight, searching for uplift currents around the aerodrome.

After one hour of flight at 15:31 the pilot concluded that the glider was sufficiently checked for further operation.

According to the pilot's statement, at the altitude of 700 m AMSL, when making a right-hand turn in the uplift current with average climbing speed of 1 m/s, the glider lined up for a straight-line flight and did not react to deflection of controls.



The pilot reported on the ATZ frequency of the aerodrome LZTR problems with control and tried to manage the situation. After several attempts at putting the glider to the right-hand turn the pilot decided to try the left-hand turn.

Once the glider had been put in a left bank, it went into a stall with left-turn spin, which the pilot was able to stop by vigorous pushing and then reported on the ATZ frequency of the aerodrome LZTR the impossibility of turning right.



Subsequently the pilot commenced descent at course 300° with opened air brakes, intending to line up the landing axis of RWY14 by a left-hand turn. Following the lining up, according to the pilot's statement, he was unable to keep the landing direction, because the glider was continuously turning left. The pilot closed the air brakes and intended to continue the landing manoeuvre by lining up the axis of RWY 14 again in order to complete the left-hand turn.

However, having been put in the left-hand turn, the glider again went into a left-hand spin.



After the stopping of spin rotation the glider was in a steep dive low above the ground. Therefore the pilot decided to solve the situation by field landing in the direction of the glider, but all he managed to do was open the air brakes. Afterwards, the glider came into a harder slipping contact with the ground, which caused its damage. Further damage to the glider occurred in the ground roll phase, because it continued to turn left. The pilot left the damaged glider with help of a passer-by.

The accident was reported to the Aviation and Maritime Investigation Authority of the Ministry of Transport, Construction and Regional Development of SR.

Daytime: day
Flight rules: VFR

1.2 Injuries to persons

Injury	Crew	Passengers	Other persons
Fatal	-	-	-
Serious	-	-	-
Minor	1	-	-
None	-	-	-

1.3 Damage to glider

The glider was destroyed in the accident:

- Broken hull,
- Damaged lower part of body and cockpit.





1.4 Other damage

No circumstances with potential claims for compensation of other damage toward a third party were notified to the Aviation and Maritime Investigation Authority.

1.5 Personnel information

Pilot:

A national of the Slovak Republic, aged of 65 years,
Holder of the glider pilot (GPL) licence issued by the Civil Aviation Authority of the Slovak Republic, with marked validity until 31.12.2021.

Qualifications

FI (GLD) with marked validity until 31. 12. 2016

GLD with marked validity until 31. 12. 2015

Flying experience

Total flight hours: 2108 h 55 min, 3098 flights

Glider type experience

Based on data from the log-book, the pilot conducted the last flight with this glider type on 10 August 2012. The next flight with this type was conducted by the pilot on the day of accident, i.e. on 6 June 2015; it was the first flight of the glider following a general overhaul.

Medical certificate of 2nd class with marked validity until 08.04.2016.

1.6 Information about glider

Type: Cirrus VTC
Registration No: OM-2908
Serial number: 123
Year of manufacture: 1972
Manufacturer: Vazduhoplovno Technički Centar Vršac
MTOW: 400 kg

Total operating hours since manufacture: 2999 h 48 min and 1675 flights

Certificate of airworthiness No. 3188, issued on 23.04.2009.

The verification of airworthiness was conducted on 07.05.2015, with validity until 07.05.2016.

1.7 Meteorological situation

Clear sky, amount of clouds 1-2/8, visibility above 10 km. Wind 150⁰, 4 to 5 m/s.

1.8 Aids to navigation

N/A.

1.9 Communications

The glider was equipped by radio communication equipment allowing the two-way radio communication with all air stations at every moment.

1.10 Aerodrome information

N/A.

1.11 Flight recorders

Flight recorder (FR), type approved by IGC FAI for confirmation of gliding performance.

1.12 Wreckage and impact information

The glider landed in the field 1.84 km north-west of the threshold of RWY14 of the aerodrome LZTR.



1.13 Medical and pathological information

The pilot complained of pains in the area of back and was transported to the hospital for observation.

1.14 Fire

No fire broke out.

1.15 Survival aspects

The search and rescue operations by SAR means were not required.

1.16 Tests and research

- Inspection of the glider was performed with the aim to verify whether some controls had not been damaged. The result of inspection was negative.
- Following a visual check of the wreckage and inspection of the fracture areas by the commission, the inspectors found shining surfaces sprayed by colour, which could have get to the hull margin during preparation of the mould in the manufacturing process. The commission concluded that during the manufacturing procedure, before gluing of the halves of the hull, the surface of the glued joint had not been perfectly prepared for gluing.



- During 3,000 hours of revision the glued joints of the whole glider were revised according to procedures determined by the manufacturer, with negative results.
- The staff of the Polymer Institute of the Slovak Academy of Sciences examined a sample of broken hull for the glued bond strength in the longitudinal plane and analysed the white colour found on this joint.

Conclusions of tests:

- The performed tests did not allow the unambiguous conclusion as to whether physical damage to the glider hull had occurred during the flight or after the impact of the glider to the ground.
 - Different values of strength of hull parts in the glued area were not proved.
 - Material on the rupture surface has the same composition as the colour used for glider surface spraying, but it is hard to tell how this fact could have influenced the strength of glued joint.
- Calculation of the centre of gravity: CG(RF) – position of the glider’s centre of gravity in flight
 Data on the weight and centre of gravity of the empty glider according to the weighing record following a general overhaul dated 5 May 2015: MTOW 400 kg.
 Pilot seat load: maximum 110 kg, minimum 70 kg.

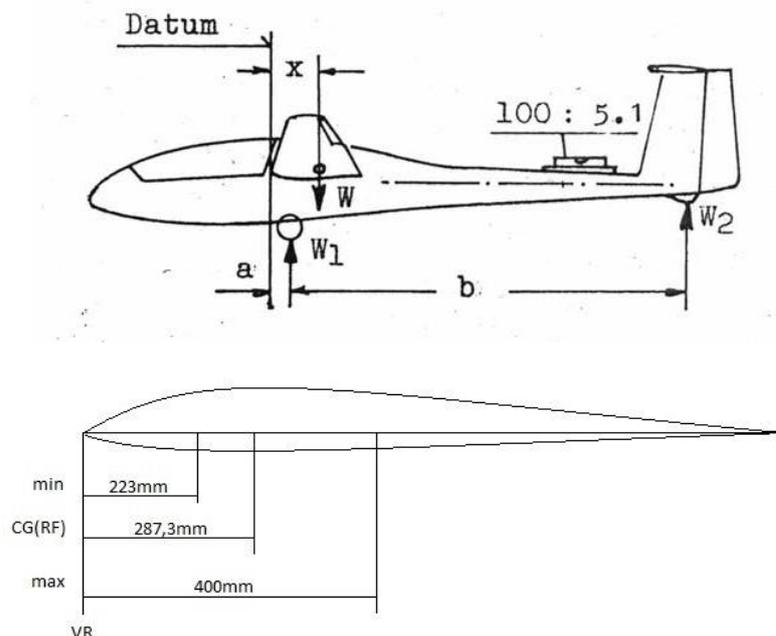
$$CG(RF) = \frac{CG(E) \times W - a \times Wp}{W(RF)}$$

$$CG(RF) = \quad \quad \quad \mathbf{287.3mm}$$

- CG(E) 618.6 mm – position of the empty glider’s centre of gravity according to the report on the certificate of airworthiness dated 7 May 2015.
- W 304.2 kg – empty weight according to the report on the certificate of airworthiness dated 7 May 2015
- a 500 mm – position of the pilot’s centre of gravity according to the flight manual in front of the datum - negative moment
- Wp 128 kg – weight of the pilot
- W(RF) W+Wp - (304.2 kg+128 kg = 432.2 kg)

Extreme positions of the centre of gravity indicated in the flight manual:

- Maximum front: M.F.C.G. = 223 mm behind the datum
- Maximum rear: M.R.C.G. = 400 mm behind the datum



1.17 Organizational and management information

The flight operation was performed in accordance with aeronautical standards valid in the territory of the Slovak Republic and local regulations.

1.18 Additional information

N/A.

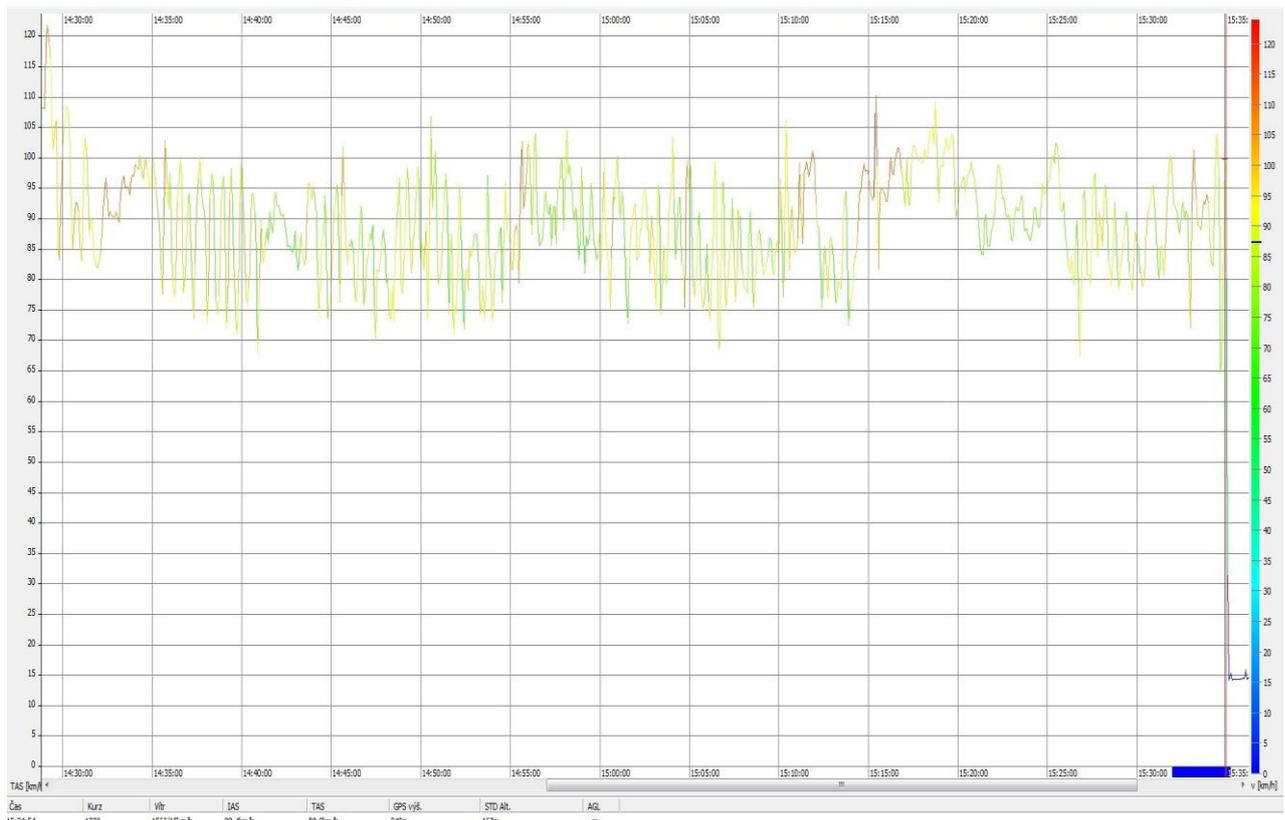
1.19 Useful or effective investigation techniques

Standard investigation techniques were used.

2. ANALYSIS

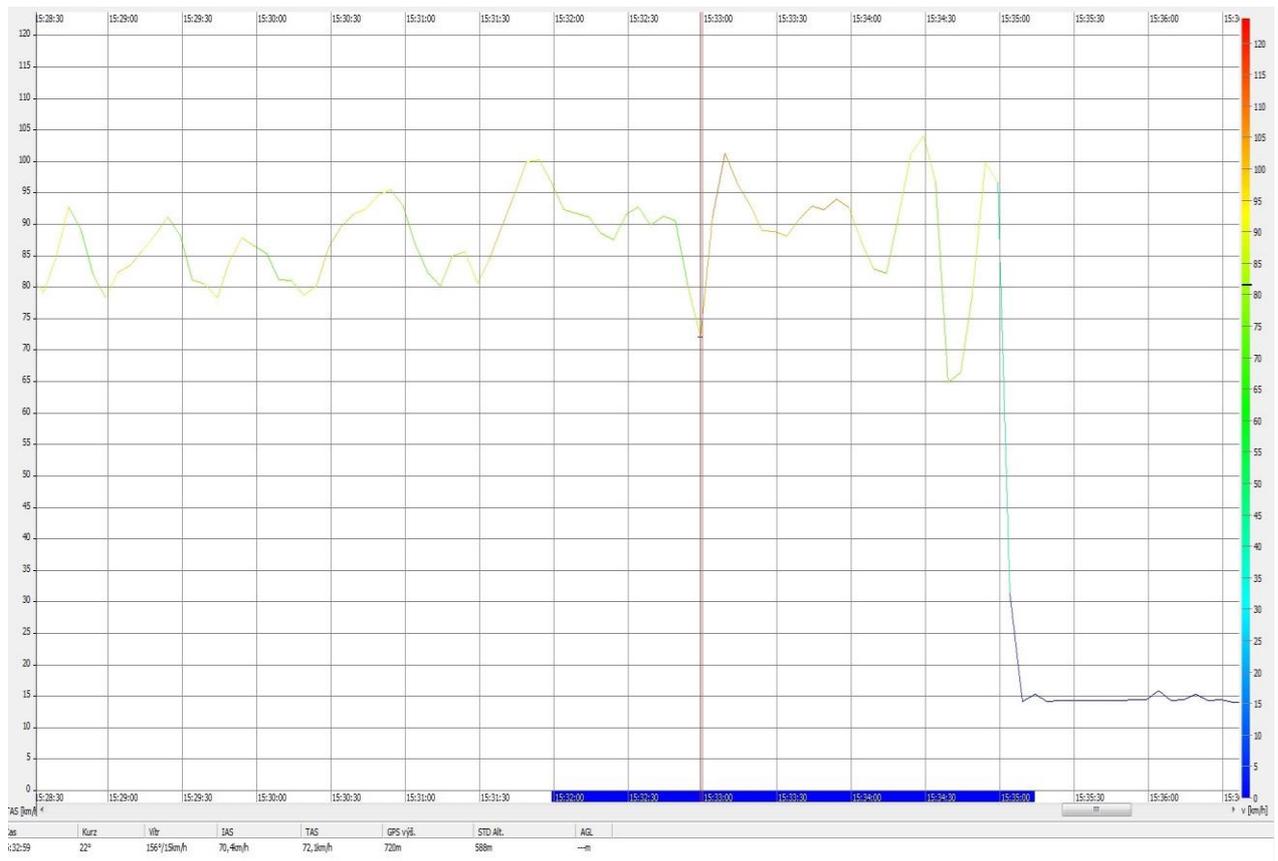
Activity of pilot

According to the onboard flight recorder during the critical flight the pilot flew with the glider at low speeds near to the stall speed. Moreover, the controls were low-efficient and did not allow him to perform the planned manoeuvres. At the attempted left turn the glider changed from the left-hand turn to the left wing stall with a sign of left spin.



Stall speed of 75 km/h at area load in the critical flight
Optimal flight speed of 85-90 km/h at area load in the critical flight

At the last flick into a left spin the glider was flying in such a low altitude that all the pilot could do was fully extend the air brakes and land in the field in front of him. After the contact with the ground at speed of about 100 km/h the glider did not continue by straight landing run, but he turned left in slipping, which caused destruction of the front section and breaking of the rear part of the hull.



3. CONCLUSIONS / CAUSE OF ACCIDENT

3.1 Findings

Pilot

- According to submitted documentation the pilot had valid qualifications for flights with given type of aircraft,
- At the time of accident the pilot was not under the influence of alcohol, drugs or common medicaments which might have decreased his attention during flight.
- The maximum pilot seat load was exceeded by 18 kg.

Glider

- The glider had valid documentation and did not show any fault before the accident.
- The centre of gravity was near the maximum permissible value.
- Maximum MTOW was exceeded by 32.2 kg.

3.2 Cause of air accident

Flying near the stall speed limit.

4. SAFETY RECOMMENDATIONS

The final report does not contain any safety recommendations.

Bratislava, 11.05.2016