



MINISTRY FOR
INNOVATION AND TECHNOLOGY
TRANSPORTATION SAFETY BUREAU

FINAL REPORT

2017-259-4

Accident

Bassano del Grappa, Italy

22 May 2017

Gin Atlas

BC-312

The sole objective of the safety investigation is to reveal the causes and circumstances of aviation accidents or incidents and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future. It is not the purpose of this activity to investigate or apportion blame or liability.

General information

This investigation has been carried out by Transportation Safety Bureau on the basis of

- 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 repealing Directive 94/56/EC,
- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes to the Convention on International Civil Aviation signed in Chicago on 7th December 1944,
- Act CLXXXIV of 2005 on the safety investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbt.),
- NFM Regulation 70/2015 (XII.1) on safety investigation of aviation accidents and incidents, as well as on detailed investigation for operators,
- In absence of other relevant regulation in the Kbt., in accordance with Act CL of 2016 on the general rules of administrative authority procedure and service.

The competence of the Transportation Safety Bureau of Hungary is based on Government Regulation 278/2006 (XII. 23.), and, as from 01 September 2016, on Government Regulation № 230/2016. (VII.29.) on the assignment of a transportation safety body and on the dissolution of Transportation Safety Bureau with legal succession.

Pursuant to the aforesaid laws,

- Transportation Safety Bureau Hungary shall investigate aviation accidents and serious incidents.
- Transportation Safety Bureau Hungary may investigate aviation and incidents which – in its judgement – could have led to more accidents with more serious consequences in other circumstances.
- Transportation Safety Bureau Hungary is independent of any person or entity which may have interests conflicting with the tasks of the investigating body.
- In addition to the aforementioned laws, the ICAO Doc 9756 and the ICAO DOC 6920 Manual of Aircraft Accident Investigation are also applicable.
- This Report shall not be binding, nor shall an appeal be lodged against it.
- The original of this report was written in the Hungarian language.

Incompatibility did not stand against the members of the IC. The persons participating in the safety investigation did not act as experts in other procedures concerning the same case and shall not do so in the future.

The IC shall safekeep the data having come to their knowledge in the course of the safety investigation. Furthermore, the IC shall not be obliged to make the data – regarding which the owner of the data could have refused its disclosure pursuant to the relevant act – available for other authorities.

This Final Report

was based on the draft report prepared by the IC and sent to all affected parties (as specified by the relevant regulation) for comments.

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Translation

This document is the translation of the Hungarian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur. In this case, the Hungarian is the authentic, official version.

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Definitions and abbreviations

AGL	<i>Above Ground Level</i>
safety training	<i>training for paraglider pilots, performed above water under supervision of a safety instructor</i>
EASA	<i>European Union Aviation Safety Agency</i>
ICAO	<i>International Civil Aviation Organization</i>
MIT	<i>Ministry for Innovation and Technology</i>
TSB	<i>Transportation Safety Bureau (Hungary)</i>
Kbvt.	<i>Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents</i>
LT	<i>Local Time</i>
spiral dive	<i>Spiral dive is the most efficient manoeuvre the wing offers to achieve a high-rate descent. It is a manoeuvre initiated from a high bank turn in which the paraglider's longitudinal axis gets steeper, until almost vertical, with the leading edge facing downwards. This allows the pilot to descend at a high rate at high peripheral speed while rotating around a vertical axis, which is outside the paraglider.</i>
MND	<i>Ministry of National Development</i>
paragliding student	<i>a person who participates and in paragliding training performs his/her flights under supervision of an instructor</i>
Student	<i>The paragliding student involved in the accident.</i>
Instructor	<i>The person holding an instructor certificate who was in contact with the Student and who was present at the accident.</i>
IC	<i>Investigating Committee</i>
wingover	<i>A series of dynamic turns where the bank angle increases until the pilot swings higher than the wing.</i>

Introduction

Occurrence class	Accident	
Aircraft	Manufacturer	GIN
	Type	ATLAS
	Registration sign	CB-312
	Operator	Private person
Occurrence	Date and time	May 2017, 16:48 LT
	Location	Bassano del Grappa, Italy (Figure 1)
Number of people seriously injured in the accident:		1 person
Extent of damage to the aircraft involved in the occurrence:		No damage

Any clock-time indicated in this report is given in local time (LT). Time of the occurrence: LT= UTC+ 2 hours.

All geographical coordinates indicated in this report is given according to the WGS-84 survey.



Figure 1: Location of the occurrence in Italy (source of map: google maps)

Reports and notifications

The occurrence was reported to the dispatcher of TSB on 22 June 2017, at 18:53 (one month after the accident) by a private individual.

Investigating Committee

The Head of TSB assigned the following investigating committee (hereinafter referred to as the “IC”) to the investigation of the case:

Investigator-in-charge	Miklós Ferenci	Investigator
Member	Zsuzsanna Nacsá JD	Investigator

Overview of the investigation process

During the investigation, the IC:

- obtained the video record of the flight taken by the helmet cam of the pilot who had been injured in the accident;
- analysed the visual and audio information of the video record;
- interviewed witnesses;
- relied on expert assistance;
- relied on assistance of a paragliding instructor.

Short summary of the occurrence

On 22 May 2017, a paragliding student who participated in a cross country flying camp in Italy performed a flight manoeuvre (spiral dive), upon suggestion of a paragliding instructor by radio, for which he had not been prepared on the ground prior to the flight. The Student commenced the manoeuvre, but was not able to exit from it properly therefore he hit the ground at high speed. The Student suffered an injury causing permanent disability.

The cause of the accident was that the Student did not manage to exit from the spiral drive.

According to the IC, a contributing factor to the accident was that the Instructor suggested a flight manoeuvre which the Student would not have performed on his own accord and for which he had not been prepared beforehand.

Similar occurrences can be avoided by following the relevant rules; the Investigating Committee of TSB found no circumstance which would warrant a safety recommendation.

1. Factual information

1.1. History of the flight

A paragliding student travelled to Bassano, Italy, to participate in a camp dedicated to cross country flight; he took his own paraglider which was new to him. When announcing the camp, its organiser indicated that the condition of participation was 25 hours of flight or participation in a safety training. The Student participated in a safety training before his sending his application for the camp, so he met the criteria indicated. At the same time, no B badge qualification result was indicated in his licence; at that time, the Student's highest rating was Student II.

On the first day of the camp, the Student had two take-offs and flew two and a half hours. According to his report, on the second day of the camp, he took off after receiving ground-based preparation for thermal soaring from his Instructor. After about half an hour of flying he left the area and headed for the landing zone, where he climbed again in a thermal, up to ca. 800 metres AGL. Then he decided to land, while using his altitude to practice wingover manoeuvres. In one of the breaks between two wingovers, at an altitude of ca. 400 metres AGL near the landing zone¹, he received a radio message from his Instructor in the landing zone: "Now, why don't you do two easy spirals". As the Student reports, although he thought he should not lose altitude in a spiral dive in the given situation, he trusted his Instructor's judgment, and did as she said.

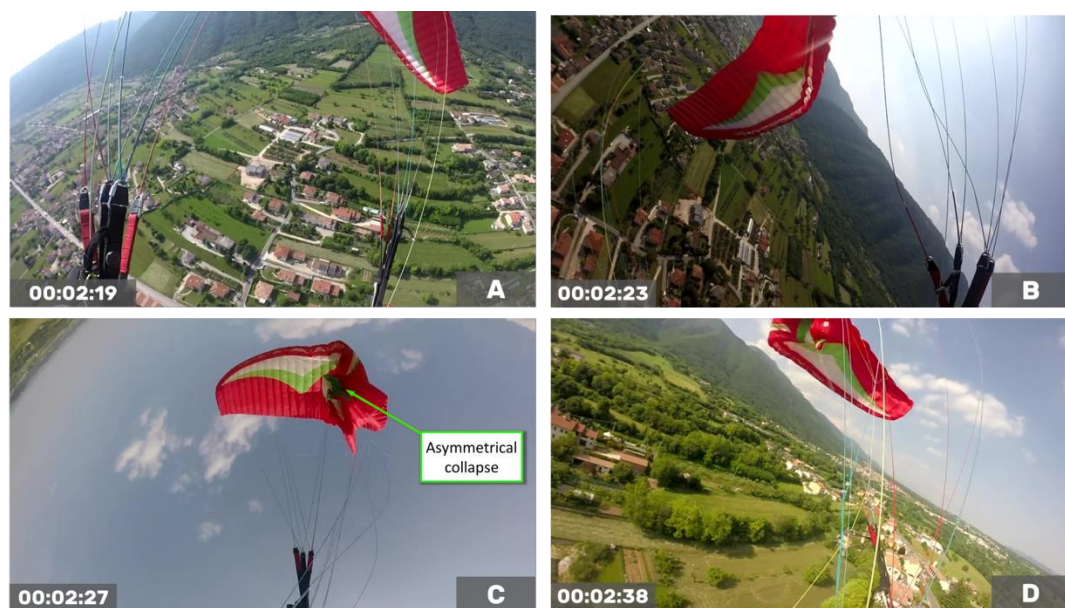


Figure 2: pictures from the video record taken by the Student's helmet cam (Time stamps indicate time after start of recording)

Entering the spiral dive was smooth (picture A, Figure 2), but, during the exit, due to the Student's inadequate control of the wing, one half of the canopy collapsed (picture B, Figure 2) and got tangled in the supporting lines (cravatte). Subsequently, he got into a spiral with continuously increasing bank (picture C and D, Figure 2). In that situation, the Student could have opened his reserve parachute – the Instructor also told him to do so – but, according to his report, he did not find the handle of the reserve parachute, so he crashed into the ground, still in a high-speed dive. 21 seconds of time elapsed between the asymmetrical collapse and the ground impact.

¹ According to report of the Student

1.2. Injuries to persons

The Student suffered a serious injury in the accident, which caused him permanent disability.

1.3. Damage to aircraft

The aircraft involved was not damaged in the accident.

1.4. Other damage

The IC had got no information on other damage by the completion of the investigation.

1.5. Pilot data

1.5.1. Pilot-in-Command

Age, nationality, gender		33 years old, Hungarian, male
Licence data	Type	Paragliding Student, Class II
	Professional valid until	No expiry
	Ratings	may perform training flights without altitude limitation in non-turbulent weather, according to guidance by his/her instructor, or middle-level training flights in the presence of an instructor
Medical class and valid until		LAPL from 02 May 2016 to the date of the accident
Flying hours	In the previous 24 hours	3.5 hours
	In the previous 7 days	3.5 hours
	In the previous 90 days	Not known
	Total:	~ 24 hours
Aircraft types flown:		Swing Axis Gin Atlas

According to the documents made available to the IC, the total number of hours flown by the Student in 4 years is 24 hours. Of that, he flew 3.5 hours in total with his new wing during the two days preceding the accident.

According to his report, the Student participated in safety training (performed above water) during the years preceding the accident, but he used to fly another wing (a Swing Axis) at those training sessions. The Student had difficulty exiting from the spiral dive at those trainings, too. He had not known the characteristics of his new paraglider enough yet.

1.6. Aircraft data

1.6.1. General

Category	Ultralight aircraft, paraglider
Manufacturer	GIN GLIDERS Incorporated
Type	Atlas
Year of manufacture	2015
Serial number	Q6100483P
Registration sign	BC-312
Name of the owner	Private individual
Name of the operator	Private individual

1.6.2. Notes relating to airworthiness of the aircraft

The paraglider had a technical certificate issued on 16/05/2017 and valid till 16/05/2018.

No information emerged during the investigation on malfunction of the structure or any system of the aircraft prior to the occurrence which would have contributed to the occurrence or influencing the course of events.

1.7. Meteorological information

The occurrence took place at daytime, in good visibility conditions and generally in circumstances which allowed long paragliding flights.

1.8. Aids to navigation

The navigation equipment did not influence the course of events, so it needs no detailed discussion.

1.9. Communications

The Student and the Instructor were in radio contact with each other.

1.10. Aerodrome information

The take-off was from a start place near Bassano del Grappa (Italy) on 22 May 2017, but the exact location and time of the start are not known. There are several paragliding start places in the neighbourhood (Figure 3).

The planned landing zone was in Bassano; coordinates: 45.806486N, 11.785255E.

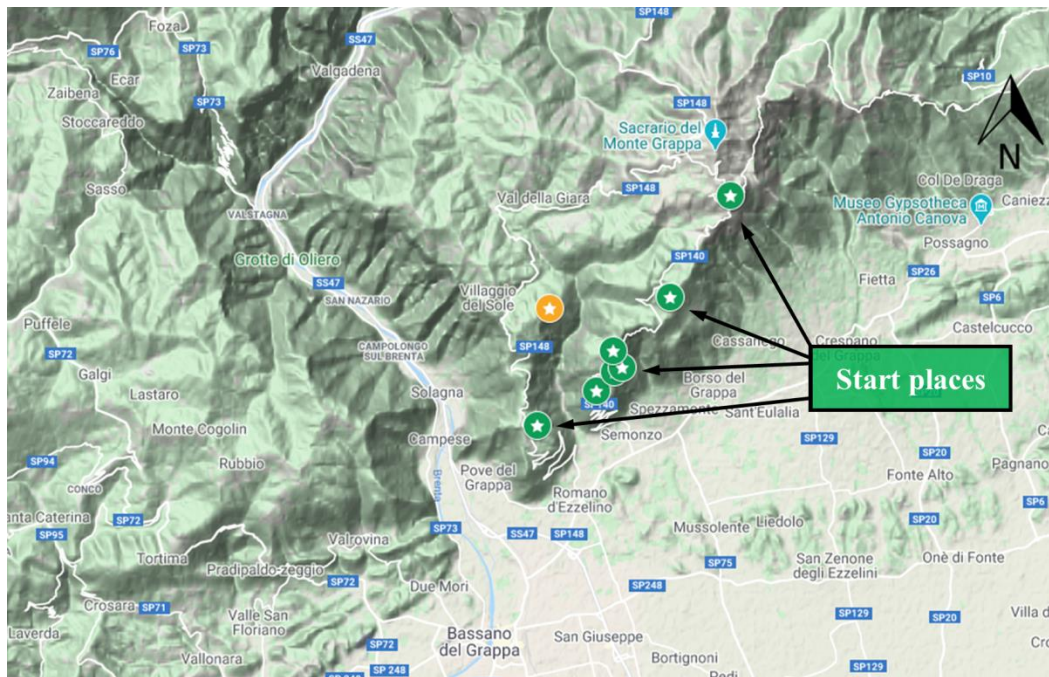


Figure 3: Start places near Bassano del Grappa (source: <https://www.vivereilgrappa.it/en/landings-and-take-offs.htm>)

1.11. Flight recorders

The Student took video and audio records during his flight, using a helmet-mounted camera. Data from the video record was analysed by an expert invited by the IC and TSB.

1.12. Wreckage and impact information

There was no wreckage in connection with the accident.

The opinion of the IC is that ground impact took place very near the spot with the coordinates 45.809824N, 11.785683E, approx. 370 metres of the planned landing zone.

1.13. Medical and pathological information

There was no evidence that physiological factors or other impediments had affected the legal capacity of the Student.

1.14. Fire

There was no fire in connection with the occurrence.

1.15. Survival aspects

People staying near the spot of the accident started rescue immediately.

The use of a smaller (than the main parachute) parachute, the so-called reserve parachute as part of the equipment is widely spread in paragliding. During their training, paragliding students learn how to use it (see 1.18.1). The handle of the reserve parachute is positioned in such manner that is easy of access for the pilot. According to his statement, the Student could not find the handle of the reserve parachute when he attempted to open the reserve parachute.

1.16. Tests and research

The IC did not perform or order tests or special inspections.

1.17. Organisational and management information

1.17.1. The organisation which organised the flying camp

According to the accountable manager of the organisation, participation in the camp was subject to a condition: either 25 hours of flight or participation in a safety training. The intent of the accountable manager was to organise a camp for those paragliding pilots who had the “Pilot I” certificate, but he did not specify that as a condition. As far as the Instructor remembered, participation in safety training had been a condition of participation in the camp.

According to the Student’s report, he thought he met the conditions, and that he would fly there within his own organisation, under supervision of a paragliding instructor. However, the Instructor, who says she did not check the participants’ ratings, did not know that there might have been such paragliding students in the camp that needed a paragliding instructor’s supervision.

1.17.2. The Instructor’s activity

According to the Instructor (who performed such activity within the organisation running the camp), previous participation in a safety training was a condition of participation in the camp (1.1). The Instructor’s words reflect that he thought that those who had completed a safety training necessarily held a “Pilot I” certification as well. The Instructor had asked the applicants to complete a form asking for the applicant’s previous qualifications, but she did not check the applicants’ licences and ratings, because, as she said, she trusted in everyone. According to the Instructor, she thought everyone she undertook to supervise at the camp held a pilot certificate.

The Instructor suggested the Student such a manoeuvre through the radio which he had not prepared him for on the ground beforehand.

According to the Instructor, she knew that the Student had already participated in a safety training, but she did not know that the Student had had problems with exiting from the spiral drive during his training (1.5.1).

The Instructor had the Student practiced such a flight manoeuvre without making sure that the Student has sufficient previous experience with, and she had not performed the necessary preparation (required in the training manual (1.18.5)) of the Student for such manoeuvre beforehand.

1.18. Additional information

1.18.1. The paragliding training system

According to the Training Manual of the Student’s training organisation, paragliding training takes place at three levels.

Level 1: Basic training

The Student (then Paragliding Student I) is entitled to perform, under direct supervision of the instructor or assistant instructor, the manoeuvres specified in the Training Manual. Basic training ends up in an “A badge”, after which “Paragliding Student I” becomes “Paragliding Student II”.

Level 2: Intermediate training

In order to enrol this training, a student must have the “Paragliding Student II” entry in his/her logbook. Here, he/she is entitled to perform training flights in the presence of a paragliding pilot who holds a Licence B, and to perform the tasks specified for intermediate training in the presence of his/her instructor. The intermediate training ends up in a “B badge”.

Level 3: Advanced training

In order to enrol this training, a person must have the “B badge” entry in his logbook. Advanced training may be safety training, instructor training and operation inspection training.

The manoeuvre (spiral dive) ending up with an accident is part of the intermediate training, and a student of “Paragliding Student II” level may only perform it during intermediate training in the presence of an instructor, and in compliance with the Training Manual (1.18.5).

1.18.2. Excerpts from the opinion of an expert invited by TSB

“On the basis of the video record, the Student cannot be regarded as an experienced pilot. This is first of all shown by the lack of the dynamic use of the body weight during the manoeuvres (wingover and spiral drive) performed on the basis of the instructions received through the radio. The pilot himself does not show uncertainty – he even looks quite resolute within his limits.

It should be noted that, during the spiral drive manoeuvre started on the basis of the instructions received through the radio, the errors of the exiting technique might have been influenced to some extent also by the small wingover manoeuvres practiced beforehand.

...

The Instructor provided assistance (via radio) with the wingover manoeuvres (which were of low difficulty). The Student expressed his joy audibly on completion of the manoeuvres. Then, the Instructor intended to help the Student with the spiral dive manoeuvre. The instructions given by radio during the manoeuvre could as well have been suitable, however, it can be stated that the Student had not been prepared for performing such a difficult spiral dive manoeuvre including proper exit from such spiral dive.

At the end of the exit, the unconsumed kinetic energy resulted in a higher speed than the normal airspeed, due to which the pilot swung through under the wing, and the wing tipped to the side relative to the pilot.

After the cravatte, which resulted from the swing, and following a brief period of uncertainty, the Instructor clearly said that the use of the reserve parachute was necessary.

...

We should notice that the accident took place in a camp, and the preparation for cross country flight had been suitable, according to the information available.

However, there was no preparation for proper execution of the spiral dive which can be mentioned as one of the causes of the accident.

Therefore, on the basis of the visual and audio records, it may be stated that there was preparation for cross country flight but there was no preparation for the spiral dive which appears to be the root cause of the accident.

...

The causal chain leading to the accident can be broken down to the following elements:

4.1. Preparation for the wingover and the spiral dive manoeuvres was not included in the preliminary preparation.

4.2. The Student started the said manoeuvres after 2 hours of flight which was relatively long compared to his level of experience. In that phase, one is less able to focus his attention, and even the flight elements otherwise learnt may be performed with less success in a tired state than during previous practicing.

4.3. The spiral dive was unambiguously started upon suggestion received through the radio. The Instructor failed to check the Student's skills relating to exiting from the spiral dive earlier.

4.4. Up to a point, the Student seems to get the increased kinetic energy absorbed properly during the exit. It should be noted that radio communication can only be heard quite uncertainly due to the wind noise caused by increased speed, therefore ground-based preparation is very important. At the end of a seemingly correct exit, the moderate pulling of the L/H brake (done for some inexplicable reason, or perhaps explicable as an after-effect of the previously completed wingover) causes the wing to tip on the left, in which position the canopy should be blown up by a load acting in the direction of the wing, which is almost impossible from the lateral direction.

4.5. After the tipping of the wing, the pilot falls over besides it, and the cravatte occurs immediately, as it can be seen on the video record. It should be noted here that the fact of cravatte could not have been clear for the Student or the Instructor at the site, therefore they might have thought that collapse had occurred (posterior analysis of the video record gives a largely different perspective to the expert – it is very difficult to judge the situation at the scene). Asymmetrical pumping is a normal solution in the case of a collapse, but, in the case of cravatte at this altitude (of ca. 200m), the situation cannot be solved by pumping but by activating the reserve parachute immediately.

4.6. It is not clear whether the Student or the Instructor was the first to realize that only the reserve parachute could help. It is clear on the one hand that the Instructor orders the opening of the reserve parachute through radio, and that the Student seems to make efforts to open the reserve parachute, on the other. Despite the parachute training completed 4 months before, the Student fails to find the handle of the reserve parachute in his changed seating position. As a result, the reserve parachute remains unopened.

4.7. Landing takes place in an inhabited area, with the pilot's body in a practically unpredictable orientation and position; the orientation and position of the body seen on the video record would have allowed injuries of any severity.

...

The wingover manoeuvre which should typically be practiced at acro trainings specifically designed for this purpose, because, although it looks simple, its proper execution is difficult and dangerous. Although that manoeuvre was not a direct cause of the accident, but laid a foundation to it psychically, because the Instructor went on to the spiral dive following the uneventfully completed easy wingover manoeuvres.

Gradual building of the spiral drive manoeuvre can as well be performed above the ground, but gradual approach is a keyword for this manoeuvre. It is possible to move towards the manoeuvres offering sinking at higher rates step by step, primarily by improving the technique of exiting from the spiral dive. The spiral dive itself is a manoeuvre which maximally requires ground-based preparation of the Student. The Instructor must be fully aware of the Student's past, as far as his previous experience

with the affected manoeuvres is concerned. In addition, it is also essential that the paragliding student himself be aware of the effect which the increase of the physical G-force caused by the centripetal acceleration generated during the spiral dive has on his body. The lack of that knowledge may result in a loss of consciousness, which may have caused similar accidents in the past.

In summary, the accident could have been prevented by proper ground-based theoretical preparation of the Student."

1.18.3. Legal environment

Pursuant to Act XCVII of 1995 on aviation:

"Section 55(3): During his training, the student pilot shall be regarded as pilot-in-command when he is performing an independent flight mission."

"Section 58(1): The pilot-in-command is responsible for safe execution of the flight mission and for complying with the rules of aviation. It is his right and obligation to decide any related question which may emerge during the flight."

1.18.4. A paragliding instructor's opinion on spiral dive

"The spiral dive is the most efficient manoeuvre of the paraglider as far as high descent rate is concerned.

Compared to big ears (2-4m/s) or B-stall (4-8m/s) manoeuvres, the spiral dive may provide a descent rate of 20m/s.

The paraglider

Different wings show different behaviours in the spiral dive. In the early history of paragliding, the behaviour of wings in spiral dive was not studied much. Investigations into the conspicuously large number of accidents involving spiral dive found that certain wings firmly remained in a steeper spiral dive, which confused less experienced pilots who then were unable to exit from the spiral on time. In addition, such stability of the spiral dive occurred with certain wings designed for beginners.

Since then, the behaviour in spiral dive is also included in the type certification of wings. Wings which show stability in the spiral dive cannot be classified as beginner/training paraglider.

Spiral dive testing of the wing is not exact because the behaviour of the device largely depends on the intensity of entry into the spiral dive, i.e. on the extent of loading. The test procedures are also different: there is no uniform test method.

Spiral dive is often prohibited with some modern competition-class wings. The main reason for this is that the cords and the material of the canopy are extremely thinned.

Physiological effects

Spiral dive is a fairly fast rotation with short radius. In order to achieve higher descent rates, both the wing and the pilot face the ground. The pilot is exposed to high G-load resulting from high centripetal force, which may have fairly different physiological effect on different pilots. A pilot with lower blood pressure may suffer a loss of consciousness even in a less steep spiral dive producing low descent rate. In addition, such effect largely depends not only on the general physical condition of the person but also on his current state.

Flight

One will not "get into" a spiral dive or drive the wing into a spiral dive incidentally during flight, but a spiral generated by a gross asymmetric deflation may lead to a situation which is close to the spiral dive.

Training of the spiral dive

Paragliding instructors' views widely differ regarding the training of the spiral dive.

With regard to its hazard, some of them would remove it completely from the Intermediate training manoeuvres and transfer it to the Advanced training (safety training) manoeuvres.

There are some who suggest that that manoeuvre should only be practiced above water, with suitable safety measures (e.g. lifeboat).

Some say that, because it is one of the most efficient diving manoeuvres, one cannot escape without it from an active storm which occurs in weather with rising airflow.

Some argue, however, that it is already a mistaken situation if a pilot has to avoid a storm by means of a paraglider. Such situations can be avoided by adequate knowledge of meteorology.

Similar situations occur more frequently at competitions. But the paragliders used at competitions are almost exclusively competitive-class paragliders which are not suitable for spiral dive.

*In my opinion, the knowledge and execution of spiral dive should be included among the practical elements of B Badge, but its training should be limited to entry, a descent with low descent rate, and exit. **The physiological effect of a very steep spiral dive of several turns on the paragliding student is unpredictable, so its risk cannot be assessed, therefore it should be avoided.***

A licensed pilot who flies independently and is aware of his/her condition and limits may decide in the future whether he/she intends to acquire steeper versions of this manoeuvre.

I find that the practicing of spiral dive is safe only in controlled circumstances ("C", safety training camp), above water. And even that may come only after proper, detailed theoretical training."

(Emphasis added by the IC)

1.18.5. Excerpts from the Training Manual of the Hungarian Free Flying Association

"II. Intermediate training

1. This chapter includes those manoeuvres during which the paragliding student acquires the independence which is necessary for cross country flight. The paragliding student involved in intermediate training may perform basic-level tasks in the presence of a person with a valid paragliding pilot licence, and intermediate tasks by following the instructions of the paragliding instructor, out of earshot but within visibility of such paragliding instructor.

*2. Those paragliding students may be involved in intermediate training that are over 16 years of age, have passed a test A at least 3 months before starting intermediate training, and whose logbook includes the "Paragliding Student II" level entry in the "Training Levels" cell signed by his/her instructor, has the opportunity to use the aircraft on a regular basis, and has flown at least 5 hours in total with a paraglider. **The paragliding student must pass a theory test in special flight situations, in the use of the emergency system, and rehearse the A/1/b task again before starting the practical training.***

3. Efforts should be taken to allow the student pilot to perform the tasks with the same wing, but by all means with a paraglider which is intended for training flights (airworthiness). The flight missions should possibly be performed with equipment which includes an emergency system suitable for paragliding purposes as well as an altimeter.

If training is performed above water then the use of a life west and a lifeboat is also mandatory. It is also mandatory to remove the protector from the pod harness.

4. If a paragliding student does not fly for a period exceeding three months during the intermediate training, then he must perform at least two A Badge tasks in the direct presence of his paragliding instructor. Similar checks must be applied also if the paragliding student makes a serious mistake during a task or if his/her flying technique reflects uncertainty.

5. During intermediate training, the flight altitude is optional, and the maximum wind speed is 7 m/sec. Tasks must be finished at or above 200 metres above ground level. Intermediate training should be performed by having the following tasks executed by the paragliding student:"

.....

"Task B/5: Spiral dive

Purpose of the task: The paragliding student should become familiar with the effects of the forces which act during the spiral dive and practice how to recover from the spiral dive.

Method of execution: The paragliding student should enter the wing into the spiral dive gradually by shifting his/her body weight and increasing unilateral use of the brake, and then, upon reaching the specified descent rate, the student should recover the wing from the spiral dive. Prior to starting the task, the pilot should specify the maximum descent rate to be achieved, and reach the value specified for a successful task accomplishment gradually, by repeating the task several times.

Requirements for execution: a steady entry without the risk of a negative turn. The wing should reach a descent rate of 8 m/s. Recovery should be steady, with no deflation. During the task, the paragliding student must retain awareness of "altitude and direction". The task should be performed in both directions. The paragliding student should not perform more than 5 turns during the task.

*The paragliding instructor should ensure that the paragliding student cannot achieve a descent in excess of the specified value, because that would lead to a stable spiral. The instructor should warn the student of the possibility of this danger, and how to resolve it. **Proper use of the emergency system should be emphasised.**"*

(Emphasis added by the IC)

1.19. Useful or effective investigation techniques

The camera mounted on the Student's helmet made it possible to analyse the accident.

2. Analysis

2.1. The Student's flight experience and knowledge of the wing

According to data available, the Student flew about 24 hours between 2012 and the end of 2016. That means 6 hours a year on average (1.5.1). According to experience of the IC, 6 hours of flight per year is insufficient to safely acquire or maintain qualification.

2.2. Participation in the flight camp

According to her statement, the Instructor did not know that the person injured in the accident was a student and needed supervision of a paragliding instructor. The Student – according to his statement – regarded the Instructor as his paragliding instructor throughout their common activity (1.1). The different interpretation of their relation to each other is a consequence of the announcement of the camp, regarding that the organiser of the camp did not regard the Pilot 1 entry in the applicants' flight logbook as the condition of participation but the 25 hours of flight or successful completion of a safety training session. The Instructor assumed that those who met the said conditions necessarily were in the Pilot 1 class. The Student met the condition of participation as he met one of the conditions in the announcement, but had no right to fly independently, so he would have required guidance/supervision.

In the IC's opinion, the condition specified by the organiser does not prevent a paragliding instructor from providing training with a different purpose (from the original purpose of the camp) for a person at the Student's qualification level at the same time as the camp, provided that such training complies with the relevant requirements.

The position of the IC is that a paragliding instructor who provides instruction to a person must in each case (except for unexpected emergencies) make sure about the level of qualification of the person he/she instructs, because only correctly assessed qualification allows low-risk transfer of further knowledge.

In the case investigated, the Instructor did not assess the Student's qualification sufficiently.

2.3. The flight ending up with an accident

The first two hours of the flight ending up with an accident were uneventful. According to the IC, the continuous flight of two hours exposed the Student to considerable loads, because he had had no experience with flights of similar duration. While approaching the landing zone with the intent to land, the Student received such a task from the Instructor which seemed too risky at the given altitude (AGL ~400 metres) according to his report. The Student had performed this manoeuvre only above water at the safety training before. The Student performed the task because he trusted in his Instructor (1.1).

The Student entered in a spiral dive and then, after about two turns, he tried to recover from it. During the attempted recovery, he did not have his kinetic energy consumed adequately, as a result of which the left-hand side of the canopy collapsed and developed a cravatte at the same time. The Student did not manage to recover the canopy from the cravatte so it got into a spiral again.

The IC's position is that, with regard to the altitude where the deflation occurred, the Student should have opened the reserve parachute instead of making several attempts to re-inflate the canopy. He lost time by trying to re-inflate the wing, and when the Instructor told him to open the reserve parachute he did not find reserve handle. The accident would not have occurred or would have had less serious consequences if the Student had opened the reserve parachute at an appropriate altitude. According to the IC,

the acceleration resulting from the spiral movement made it more difficult to find the reserve handle.

According to the IC's experience, the accomplishing of a task which is theoretically not prepared and not agreed in itself imposes a significant load on any pilot. In addition, the practising of the flight manoeuvres concerned came at the end of a long-duration flight performed by the Student. According to the IC, the combined effect of the above loads imposed such a mental load on the Student which led to impairment of situation awareness, and task saturation. In the given situation, the Student was not able to pay sufficient attention either to assessment of the risk implied in practising the unfamiliar flight manoeuvres or to the execution of such tasks, and subsequently, he was not able to pay sufficient attention to the managing of the emergency situation which developed in the meantime; all this manifested in incorrect decisions (1.1, 1.18.3) and incorrect task execution (1.1) in the end.

2.4. The Instructor's activity

The relevant legislation clearly provides that the paragliding student is the pilot-in-command of the aircraft. However, it may be said in general that paragliding instructors have a lot of authority in the eyes of paragliding students, so a paragliding student is more ready to perform an instructor's instruction than to question it. Besides that, a majority of the paragliding students would like to make faster progress during their training than the pace specified in the training manuals – or than the pace their abilities would allow. According to the IC's experience, in many cases, paragliding instructors need to slow paragliding students who desire to get new tasks – and greater independence. In that environment it is hard to resist a proposal of a new task from the instructor even if the paragliding student is not sure that he/she can perform the given task successfully on the basis of his/her current state, level of experience, and the given flight altitude.

According to the Training Manual (1.18.5) and the similar opinion of the IC, in the case that the paragliding student flies his/her aircraft alone, the instructor may only give him/her a new task if the theoretical preparation of the paragliding student took place before the flight.

In the case investigated, the Instructor did not make sure of the Student's previous experience, failed to prepare the Student (1.17.1), and consequently, she had the Student practiced a flight manoeuvre which he had not been prepared for.

3. Conclusions

3.1. Findings

The Student had little experience relating to the given flight manoeuvre at the time of the occurrence. (1.5.1 and 2.1)

The aircraft was airworthy, and it had a valid airworthiness certificate. (1.6.2)

No information emerged during the investigation on malfunction of the structure or any system of the aircraft prior to the occurrence, thus contributing to the occurrence or influencing the course of events. (1.6.2)

The flight took place in good meteorological and visibility conditions. (1.7)

The Student performed the affected flight with a wing which was new and hardly familiar to him. (1.1, 1.5.1 and 1.6.1)

The Student also had had problems earlier with the execution of the flight manoeuvre which led to the accident. (1.5.1)

The Instructor did not obtain sufficient information on the Student's previous experience. (2.4)

The Instructor did not prepare the Student for the execution of the task which he proposed and which ended up with an accident. (2.4)

As pilot-in-command, the Student could have refused to perform the task, but, trusting in his Instructor, he performed it. (1.18.3)

The Student did not manage to exit from the spiral, which led to asymmetrical deflation of the canopy of the paraglider. (2.3)

The Student did not manage to open his reserve parachute. (2.3)

3.2. Causes

During the investigation, the IC came to the conclusion that the cause of the occurrence was that:

- The Student did not manage to recover from the spiral dive.


According to the IC, the following factors might also have contributed to the occurrence:

- the Instructor proposed a flight manoeuvre which the Student would not have performed on his own accord,
- the Instructor did not assess the Student's level of qualification,
- trusting in his Instructor, the Student performed a flight manoeuvre for which he had not been prepared for in beforehand.

4. Safety recommendations

Similar occurrences can be avoided by following the relevant rules, therefore the investigating Committee of TSB found no circumstance which would warrant a safety recommendation.

Budapest, 03 March 2021


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Miklós Ferenci
Investigator-in-charge


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Nacsa Zsuzsanna JD
IC Member