

**British Hang Gliding and Paragliding Association**

# **REPORT**

**Investigation of a paragliding accident which occurred at the Long Mynd, Shropshire, on the 8<sup>th</sup> August 2009 which resulted in the death of one pilot and serious injury to the other who died nine days later.**

## **Introduction**

On 8<sup>th</sup> August 2009 the British Hang Gliding and Paragliding Association (BHPA) received reports of an air accident at the Long Mynd, Shropshire that had resulted in the death of one pilot and serious injury to another. The BHPA is required by the Air Accident Investigation Branch of the Department for Transport to carry out an investigation and produce a report under its delegated authority. The BHPA tasked Mr David Thompson, BHPA Senior Technical Officer, to investigate the accident and submit a report to the Flying and Safety Committee (FSC) of the BHPA for ratification.

BHPA investigation serial number: IR 09/065

## **Summary**

On the 8<sup>th</sup> August 2009 at the Long Mynd in Shropshire and during a club level competition, a mid-air collision occurred between two pilot-rated paraglider pilots resulting in the death of one pilot and serious injury to the other. The injured pilot died nine days later while in hospital, having suffered a heart attack. The investigation that followed concluded that the mid-air collision occurred as a result of several pilots flying too closely to each other and in positions such that they had limited options for collision avoidance. When one of them made a turn to avoid colliding with one glider it placed him in the path of a third glider and the collision occurred.

**This document is confidential until ratified.**

Date ratified by the BHPA Flying and Safety Committee: 8<sup>th</sup> February 2010

## **THE STRUCTURE OF THE REPORT**

The structure of this report conforms to that recommended in the BHPA Technical Manual and is intended to follow the principles pertaining to AAIB reports. It is divided into four sections.

Section 1 - Factual information

Section 2 - Analysis

Section 3 - Conclusions

Section 4 - Safety Recommendations

## SECTION 1 - FACTUAL INFORMATION

### 1.1 History of the flight

On the morning of Saturday the 8<sup>th</sup> August in excess of sixty paraglider and hang glider pilots from six different club teams arrived at the gliding site known as the Long Mynd, Shropshire, to take part in the final of a club level competition. As well as the competition pilots, there were also a number of local paraglider and hang glider pilots present there to fly. In addition to the paraglider and hang glider pilots, the Midlands Gliding club was also flying sailplanes.

At approximately 10am the competition organiser called the pilots for the pre-competition briefing assisted by a local club committee member to help with more localised information. The task for the day was to be an open-distance task. The briefing included the following points:

- Weather conditions for the day.
- Airspace issues including how to negotiate Birmingham Airport airspace.
- Emergency radio frequency. Pilots were requested to use the competition frequency in the event of a mishap.
- Turn direction (Right hand turns). It was pointed out that not all pilots were competition pilots, and as such if a thermal had many pilots turning left, then that should be followed. Judgement and common sense was recommended.
- Procedure in the event of an air ambulance being called. (A large cross to be made with gliders, and all comp pilots to clear the area.
- Competition open/close times.
- PG bottom landing field (location, approach).
- HG bottom landing field (location, approach, hazards, location of emergency field).
- PG top and slope landing areas (with warnings about not landing in the HG overshoot/launch area and landing on MGC property).
- Demarcation of the HG and PG areas on the Long Mynd site. Respecting launch and landing areas.
- Approach hazards for HGs (and what PGs need to be aware of).
- Landing fields for HG over the back.
- Flying the ridge (not hogging the take-off area, spreading out, hazards such as power and phone lines, bowls).
- Location of model flyers.
- Flying around the MGC (acceptable height to fly over the glider station, flying in front of the glider club).
- A specific reminder that this was a small friendly competition, and not the World Championships.

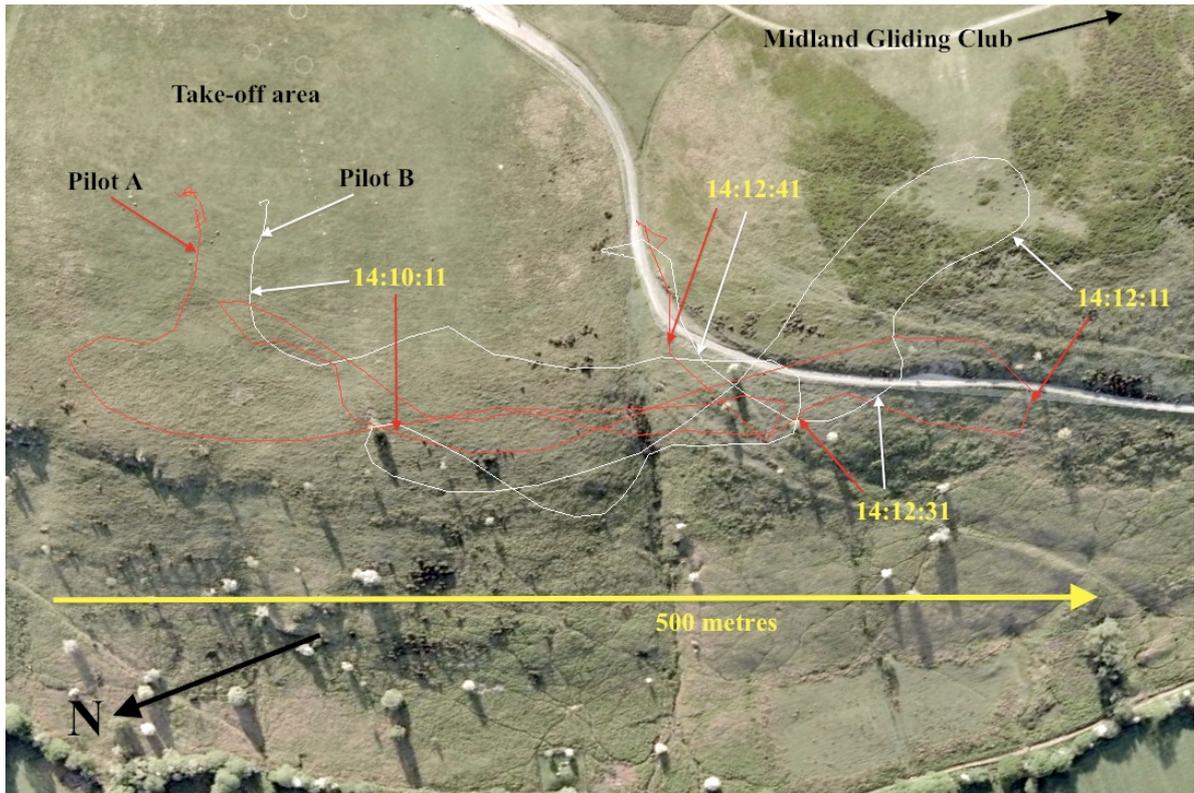
The competition start window was opened as soon as the briefing had finished with some pilots choosing to launch immediately as the weather forecast was less favourable for later in the day. Between the competition starting and midday, a significant number of the competitors had already left the hill to go cross-country.

By approximately 1pm cloud cover had increased, the light west south-westerly breeze had dropped off and the thermals weakened to such an extent that people were struggling to remain airborne. Little happened over the following hour with a few paraglider pilots launching, usually resulting in slope landings.

By approximately 2pm the cloud cover had decreased and the conditions, though light, had begun to improve. Paraglider pilots were now able to launch and remain airborne. There were now approximately 20 – 25 pilots in the air trying to make the best of the lift available with varying degrees of success.

‘Pilot A’ took off at 2.09pm shortly followed (within a minute) by ‘Pilot B’. Both pilots began to beat back and forth along the front of the hill in an attempt to gain height (see Photo 1, below).

Photo 1, showing the flight paths of Pilots A and B and their positions at points in time.



During this period 'Pilot C' had also taken off. 'Pilot C' describes how he took off and made his way through a group of pilots that were flying in the area in front of take off, before joining them in a beat in a northerly direction.

Three minutes after taking off, both 'Pilot A' and 'Pilot B' were flying in a north-easterly direction back towards the take off area. They were in a group made up of approximately seven paragliders (see Photo 2, below).

Photo 2, showing position of Pilots A and B, 11 seconds prior to collision.



‘Pilot C’ was now in a group of gliders that were attempting to thermal above the gully formed to the south of take-off where the road cuts up through the ridge, having previously completed a beat towards the north. At this point the two groups would have been less than 200m apart.

As the two groups grew closer together, ‘Pilot C’ shouted at ‘Pilot A’ to “look where you’re f\*\*\*ing going”, as in his opinion ‘Pilot A’ was not looking in the direction he was flying. ‘Pilot C’ states that he had gliders on both sides and could therefore not take avoiding action himself. On hearing the shout, ‘Pilot A’ made an immediate and sharp right turn. ‘Pilot C’ stated that ‘Pilot A’ “was clearly startled” on hearing the shout. Another witness stated that ‘Pilot A’ did not appear check to make sure it was clear to his right before making the turn.

The right turn initiated by ‘Pilot A’ brought him directly across and into the path of ‘Pilot B’ who had been behind, to the right and slightly lower than ‘Pilot A’. ‘Pilot A’s body contacted the upper lines of the centre of ‘Pilot B’s glider causing the fabric to become wrapped around ‘Pilot A’. At the point of impact the two pilots were approximately 150 – 180 ft above the ground. Within two to three seconds ‘Pilot A’ had become completely engulfed in the fabric of ‘Pilot B’s glider, which was now offering no support as a wing. The two pilots began to pendulum under the wing of ‘Pilot A’, which was still flying under their combined weight. This caused the glider to enter a dive, which accelerated the two pilots towards the ground. About 3 seconds after the glider began to dive, both pilots crashed to the ground by the road, just down and to the south of the take off area.

‘Pilot A’s partner states that ‘Pilot A’ told her while in hospital, that during the fall he had been trying to free himself from the fabric of the glider so that he could deploy his emergency parachute. ‘Pilot B’ did not throw his emergency parachute.

The incident was witnessed by a large number of people and the two injured pilots were attended to almost immediately. The emergency services were called and an air ambulance arrived within fifteen minutes, closely followed by a police helicopter. There were at least two doctors among the pilots present, who took control of the first aid while waiting for the rescue services. The two pilots were taken to hospital where ‘Pilot B’ was pronounced dead shortly after arrival. ‘Pilot A’, who appeared to be making a slow but steady recovery, died nine days later.

## 1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	1	-	-
Serious	1	-	-
Minor / None	-	-	-

## 1.3 Damage to the aircraft

No damage to either aircraft.

## 1.4 Other damage

No other damage.

## 1.5 Personnel information

‘Pilot A’ was a 66-year-old male. He joined the BHPA on 31<sup>st</sup> July 2005 and on the 11<sup>th</sup> September 2008 gained his BHPA Pilot rating. On 7<sup>th</sup> March 2009 he attended a BHPA Coach Course and shortly after was awarded his BHPA Club Coach licence. No flight log was found for ‘Pilot A’. He had attended a cross-country course in St Andre, France in October 2007, though during this had to be warned about flying too close to other pilots on the course. A paragliding instructor in the Yorkshire dales had also warned him about this. He also attended an SIV (Simulation d’Incident en

Vol) course in Oludeniz, Turkey in May 2008. His flight instruments show 36 flights totalling more than 30 hours between 21<sup>st</sup> April and 8<sup>th</sup> August 2009.

'Pilot B' was a 49-year-old male. He joined the BHPA in August 1999 and on the 15<sup>th</sup> April 2002 gained his BHPA Pilot rating. On 8<sup>th</sup> December 2002 he attended a BHPA Coach Course and shortly after was awarded his BHPA Club Coach licence. 'Pilot B' kept a flight log with continuous entries dated from 7<sup>th</sup> August 1999 to 24<sup>th</sup> July 2007 where the logbook becomes full. No further logbooks were found. The logbook shows 'Pilot B' gained 20 hours airtime in his first 14 months. Then in 2001 he flew on 4 days; in 2002, on 5 days; and in 2003 on 3 days. During this 3-year period he amassed 10 hours airtime. There were no further entries until 2006 when a flight of 5 minutes duration was logged. Between April and July 2007 a further 8 days and 2 hours airtime was logged. On his club renewal form dated 1<sup>st</sup> April 2009 'Pilot B' recorded that he had a total of 175 flying hours.

## **1.6 Aircraft information**

Aircraft 'A' (belonging to 'Pilot A').

Nova Rookie (extra small).

Serial Number 36672.

Manufactured 2006.

The glider type is certified at LTF 1/2 level. A paraglider of this type would be considered suitable for this level of pilot.

The harness was a Sup Air 'Alti-rando' light weight harness.

Emergency parachute was a Charley externally mounted parachute.

Helmet was a REM EN966 certified airsports helmet.

Instruments carried were Garmin 60 CSx GPS unit, Brauniger IQ variometer and a mechanical compass.

All equipment was found to be in good condition and in serviceable order though the GPS unit had sustained a crack to the glass face. When tested (for initial stage of deployment only) the emergency parachute deployed without incident.

Aircraft 'B' (belonging to 'Pilot B').

Swing Mistral 4 (28)

Serial Number 37-628-37233

Manufactured 2006.

The glider type is certified at LTF 1/2 level. A paraglider of this type would be considered suitable for this level of pilot.

The harness was an Independence Spider (small).

Emergency parachute made by Apco (serial number 44120) and was mounted in the harness.

Helmet was a Lazer open face EN966 certified airsports helmet.

Instruments carried were Garmin 60 CSx GPS unit, Digifly variometer and a Brauniger Competino flight computer.

All equipment was found to be in good condition and in serviceable order. When tested (for initial stage of deployment only) the emergency parachute deployed without incident.

## **1.7 Meteorological information**

Information from the Met Office shows a weak low-pressure system over western Ireland and a high-pressure system over central and southeast England. This gave rise to the light west to south-

westerly flow and scattered cloud experienced on the Long Mynd that day. There was also a layer of high cirrus cloud covering the area, which would explain why the thermals experienced on the day were not more powerful. The Met Office information is in line with the witness reports in that the conditions were generally light westerly winds with light to moderate thermic activity.

### 1.8 Aids to navigation

N/A

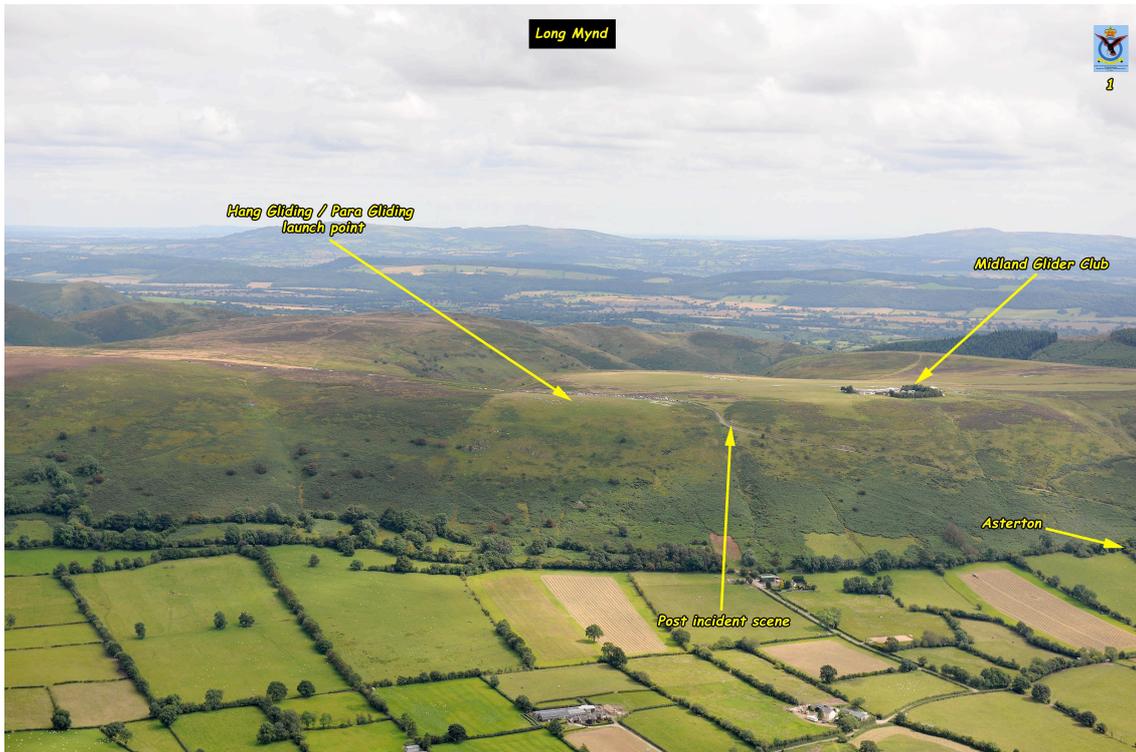
### 1.9 Communications

N/A

### 1.10 Aerodrome and approved facilities

The Long Mynd in Shropshire, England, is a part of the Shropshire Hills Area of Outstanding Natural Beauty. It is 16 km south of the town Shrewsbury, and has an area of over 22 square kilometres. The main ridge running north to south is approximately 11 km long by 4.8 km wide. The highest point on the Long Mynd is Pole Bank at a height of 516 metres (1693 feet). It is ideal for paragliding and hang gliding and has been home to the Midland Gliding Club for over 70 years. It consists of a grassy rounded top leading to a steep face before rounding out again to the fields below. The paragliding and hang gliding take off (OS grid ref: SO404918) lies approximately 300m north of the gliding club and at a height of approximately 420m giving an immediate top to bottom height of approximately 200m. The site is considered suitable for pilots of all abilities (see Photo 3, below).

Photo 3, showing a section of the Long Mynd, take-off area and incident site.

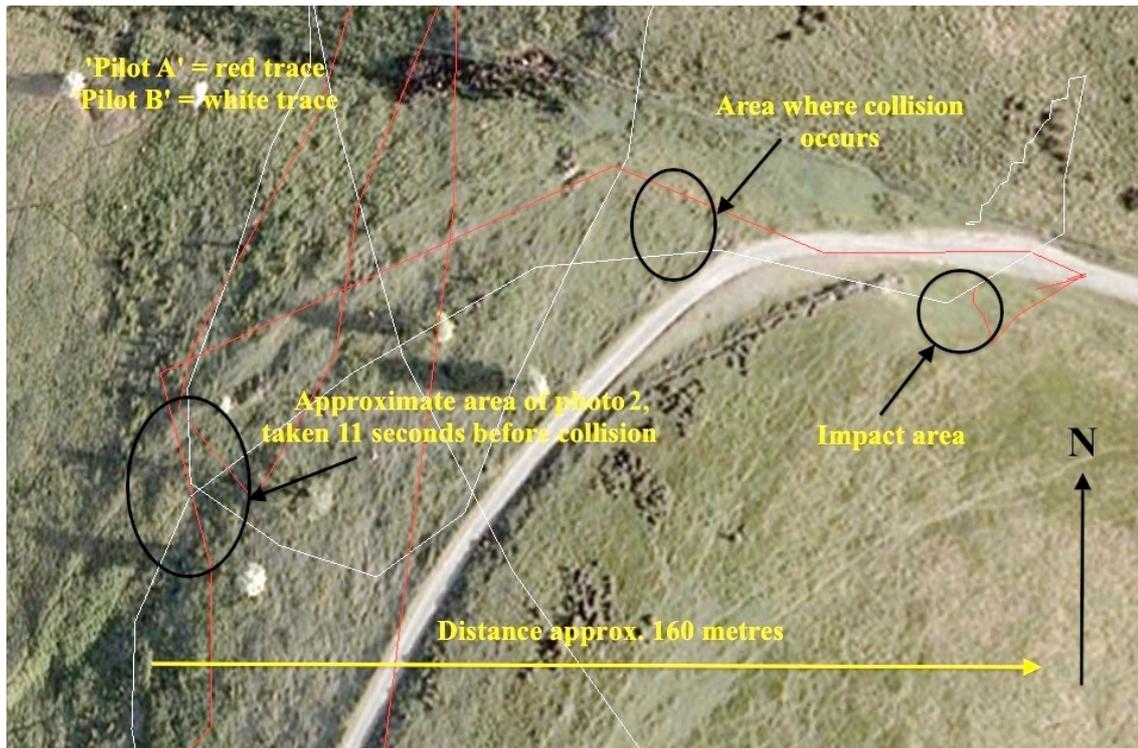


### 1.11 Flight recorders

The Garmin 60 CSx GPS unit used by 'Pilot A' and the Brauniger Competino flight computer used by 'Pilot B' were taken for analysis and the flight data successfully recovered. This data was used to establish the take off and total flight times, flight paths and height gained by both pilots. It was also used to estimate the height the two pilots fell after the collision.

'Pilot A' took off at 14:09:00 (all times are BST). He flew away from the hill then briefly north before heading south down the ridge. 'Pilot B' took off at 14:09:50, flew away from the hill and then turned left in a southerly direction. The two pilots continued to beat back and forth along the ridge (see Photo 1.) until at 11 seconds before the collision where they were in the positions shown in Photo 2 and highlighted in Photo 4, below. Approximately 10 seconds later having been in the air for between three and four minutes and while on a north-easterly track, at between 14:12:41 and 14:12:50, the two pilots collided and became entangled with each other (see Photo 4, Below). While on the north-easterly track, in the moments leading up to the collision, Pilots A and B were no more than twenty metres apart.

Photo 4, showing the collision and impact areas and also the approximate location of Photo 2.



Total flight time was approximately 4 minutes for 'Pilot A' and 3 minutes for 'Pilot B'.

Analysis of the barometric and GPS altitude traces shows the pilots fell between 46 and 52 metres (150 – 170 feet).

A combination of the analysis of the photos, the digital time information stored within the photos and the GPS track logs means the investigation was able to show the 15 seconds leading up to the collision with a good degree of accuracy. That said, all measurements are approximate, as none of the instruments from which the data was extracted had been calibrated, and being from different manufacturers, would be using different internal software to interpret the GPS data in producing the visual trace.

Analysis of the flight instruments also showed that 'Pilot A' had two earlier flights on the day of the incident and that 'Pilot B' had one flight two hours prior to the incident lasting 17 minutes.

## 1.12 Wreckage and impact information

The pilots impacted approximately 170m south of the take off area and adjacent to the access road that comes up and bisects the hill. This area is grassy and sloping, however, in this immediate area there is only a shallow layer of soil covering the underlying rock making it extremely hard. (See photos 1 and 4)

**1.13 Medical and pathological information**

Cause of death for 'Pilot A' was given as a heart attack exacerbated by underlying heart problems and contributed to still further by the injuries sustained in the fall. Bloods were not taken.

Cause of death for 'Pilot B' was given as head injuries and fall from height. The toxicology report for 'Pilot B' showed traces of THC-carboxylic acid in the urine sample, indicating the use of cannabis at some time prior to death. From the tests it could not be established whether this was from recent, or long-term use.

**1.14 Fire**

N/A

**1.15 Survival aspects**

Neither pilot was able to deploy their emergency parachute. Had either pilot managed to deploy their parachute immediately (within the first few seconds), it may have been possible to slow the descent rate to such a degree as to significantly reduce the impact force. Both parachutes were test pulled and both released from their inner containers as normal.

**1.16 Tests and research**

N/A

**1.17 Organisational and management information**

The British Club Challenge (BCC) is a paragliding and hang gliding competition open to all qualified members of the BHPA. It is a club level competition aimed at those new to competition and is the most basic of a series of competitions overseen by the BHPA Competitions Panel. The basic format involves teams of pilots representing clubs from around the UK competing against each other, initially at a regional level, the winners then meeting in a pre-arranged final. The following extract, outlining the background of the BCC, was taken from the BCC web site ([www.flybcc.co.uk](http://www.flybcc.co.uk)).

***1 Background (The Ethos)***

*The competition has been designed to encourage paragliding and hang gliding pilots to improve their flying and cross country skills through a friendly yet competitive coaching environment, by competing in teams against other clubs.*

*The primary pillars under laying the competition are flying, fun and safety.*

*The aim is to encourage teams to visit other areas of the UK and fly new and different types of sites to help improve the scope of their flying abilities.*

*At the same time pilots will have the chance to learn from one another, exchanging views and ideas on the continual improvement of skills and the sport.*

The BCC has an extensive set of rules that include; eligibility, general organisation, task setting (and cancellation), scoring and ground rules. However, there is no requirement for a ground-based official meaning the organiser can also be one of the competitors, as was the case in this instance.

It is also worthy of note that the pilots involved in the incident received excellent and immediate care from the people at the scene. Those involved should be commended.

**1.18 Additional information**

N/A

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

As the incident took place another paraglider pilot who was on the ground at the time, was taking photographs using a high quality Canon digital SLR camera with a professional quality zoom lens. Using the time code included in the digital file information attached to each photograph the investigation was able to establish, with a reasonable degree of accuracy, that the elapsed time from initial collision to the time of impact with the slope was 6 to 8 seconds.

The photos were also very useful in establishing whether the initial point of contact was between 'Pilot A's body and the leading edge or trailing edge of the glider belonging to 'Pilot B'.

## **SECTION 2 – ANALYSIS**

The investigation considered the weather on the day. The forecast for the day showed light westerly winds gradually moving round to the southwest as the day went on. This proved to be accurate with the pilots experiencing light west to south-westerly winds and light to moderate thermic conditions. These would normally be considered good paragliding conditions though on the light side for hang gliding. However, these conditions would also mean that the lift band created by the hill would be relatively narrow and that the weak and infrequent thermals would make thermalling more difficult and result in less vertical separation between the gliding pilots. The combination of these conditions added to the higher than usual number of pilots, who's aim was to go cross country, would naturally lead to crowding in the areas where lift was found – especially thermic lift. It was indeed the case that few if any of the hang gliders chose to fly at the time leading up to the incident due to the light conditions and the perceived crowding of the paragliders. While not inherently dangerous, safe flying in such conditions requires a high level of airmanship.

The weather was considered to be a factor in this incident.

The investigation considered the site. The Long Mynd has been a site where gliding has taken place for over seventy years. It has an ideal profile for gliding having a steep face and gently rounded top and bottom. The take off area is large and well kept and is owned by the local club. Landing areas are numerous and technically easy. There are well over six kilometres of soarable ridge making it more than capable of catering for large numbers of pilots. All in all, the site is considered one of the best in the UK for both low and high airtime pilots. The site was not considered to be a factor in this incident.

The investigation considered the pre-competition briefing. The pilots were given the initial briefing by the event organiser (who was also a member of one of the teams). A local club committee member (and also one of the competing team members) then continued the briefing to give essential local information. The briefing was comprehensive and included all that would have been expected in a briefing. The briefing was not considered to be a factor in this incident.

The investigation considered the fact that there were no ground-based officials at the launch area. At BHPA National level there are always ground-based officials responsible for the safe running of a competition. One of their responsibilities is to call a temporary halt, or to abandon the competition if the conditions deteriorate to a point where the safety of the competitors is compromised. Typical examples are where the weather over-develops along the route of the course creating dangerous flying conditions, or where the wind strength at take-off becomes dangerous. It is considered unlikely that having one of the organisers at take-off would have made any difference in this incident. The weather conditions were not dangerous and twenty-five airborne pilots would not be seen as any reason for alarm at a site the size of the Long Mynd. An official would not therefore have had any reason to suspend flying activities. The lack of a ground-based official was not considered to be a factor in this incident.

The investigation considered the actions of the pilots in the minutes leading up to the incident. Apart from Pilots A and B (for whom the track log data is available) it is impossible to know exactly where the estimated twenty to twenty-five pilots, still on the ridge, were. However, it is reasonably clear that there

were two distinct groups in the run up to the incident; the seven, including Pilots A and B, who were heading in a northerly direction, and those (the exact number is unknown) who were thermalling in the area above the gully just to the south of take off. As the two groups converged, 'Pilot C' had inadvertently or otherwise, got into a position where he was boxed in by other gliders and rendered unable to take avoiding action, forcing him to shout when he and 'Pilot A' appeared to be on a converging course. The fact that 'Pilot A' was seen to make an aggressive turn to the right, apparently without first looking, would suggest that he had indeed been startled by the shout from 'Pilot C' and that his reaction may have been instinctive. It is unclear from the evidence whether 'Pilot A' had the option to turn left rather than right and thereby avoid the collision, or to turn less aggressively to the right, which would have resulted in less height being lost in the turn, possibly avoiding the collision. In any case it is the view of the investigation that in the moments leading up to the incident, the pilots were flying too close to one another and in a manner that was likely to result in a collision.

The investigation considered these points to be significant factors in this incident.

The investigation considered why the pilots came to be flying so close to each other. At around 2 o'clock that afternoon the majority of the competitors had already left the site, engaged on cross-country flights. This may have put pressure on those competitors who had not yet managed to gain enough height to go cross-country, forcing them to try harder still in the light conditions (see Section 2. Analysis, paragraph 1). A combination of the weather conditions and the pressure to score points in the competition may well have caused some of the pilots to try more desperately to get into any lift (thermal) that was found. With several keen pilots and very few weak areas of lift, the temptation is for them all to rush to any perceived area of lift – and therefore to end up flying in dangerously close proximity to each other.

The BHPA training syllabus for paragliding and hang gliding (in all their various forms) contains sections on air law and in particular, collision avoidance – both practical and theoretical. By the time a BHPA pilot has attained his or her Club Pilot (CP) rating, the minimum required to fly without being overseen by an instructor, they will have passed two exams. An incorrect answer on any of the collision avoidance questions results in automatic failure of the whole paper. As well as publishing safety information through its member's magazine Skywings and on its web site, the BHPA Pilot Handbook, available to pilots, contains in-depth information relating to nearly all aspects of paragliding and hang gliding. Particularly relevant to this incident would be:

1. Chapter 16: Flying with others; Safe flying on the ridge; Safe flying in thermals.
2. Chapter 17: Avoiding accidents.
3. Chapter 23: Air Law.
4. Chapter 29: Competitions.

The following extract is taken from Chapter 29, page 270 of the BHPA Pilot Handbook:

*“One other point: safety. You cannot win competitions from a hospital bed! Know your limits and stick to them. If you are not happy about flying on a particular day (perhaps because of the weather), then don't. And when you are flying, make sure you maintain a really good lookout – competitions inevitably tend to involve a lot of pilots flying in the same bit of sky.”*

It is possible that 'competition pressure' heightened by the prevailing weak lift, may have been a factor in this incident.

### **SECTION 3 – CONCLUSIONS**

The investigation concluded that the mid-air collision occurred as a result of several pilots flying too closely to each other and in positions such that they had limited options for collision avoidance. When one of them made a turn to avoid colliding with one glider it placed him in the path of a third glider and the collision occurred.

## **SECTION 4 - SAFETY RECOMMENDATIONS**

The investigation recommends that the BHPA, through its magazine Skywings, reminds its members that when flying, whether in a competition or otherwise:

1. That it is the law (Air Navigation Order, Section 2, The Rules Of The Air Regulations 2007) that it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft. And; that an aircraft should never be flown in such proximity to other aircraft as to create a danger of collision.
2. That they should never allow a situation to develop, for example allowing themselves to be boxed in by other gliders, where they have no escape routes and their safety is entirely dependent upon other pilots manoeuvring to avoid them.

The investigation also recommends that the BHPA competitions committee review its position on 'lower level' competitions to consider whether or not all competitions above a certain size should have a ground-based official who has a clear set of roles and responsibilities.