

REPORT

**Investigation of a hang gliding accident
which occurred at the Long Mynd, Nr Church Stretton
on 26th May 2013
which involved serious injury to the pilot.**

Introduction

On 26th May 2013 the British Hang Gliding and Paragliding Association (BHPA) received reports of an air accident at the Long Mynd, Nr Church Stretton, which had resulted in serious injury to the pilot. The BHPA tasked Mr Mark Dale, BHPA Technical Manager, to investigate the accident and submit a report to the Flying and Safety Committee (FSC) of the BHPA for ratification.

BHPA investigation serial number: IR13/062

Summary

On 26th May 2013, a hang glider pilot came in low for a top landing at the Long Mynd. He collided with a paraglider pilot who was packing his equipment away. The hang glider pilot sustained serious injury.

The investigation found that the pilot suffered serious injury after colliding with a stationary person within the landing site during the landing phase. Contributory factors were the wind dropping off, use of the 'S' turn approach method, use of advanced equipment, use of a base-bar landing technique, site topography and layout, the harness and glider design and the presence of a group of three stationary people.

This document is confidential until ratified.

Date ratified by the BHPA Flying and Safety Committee: 1st November 2013

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 Sunday 26th May 2013 a number of pilots, encouraged by a favourable forecast, visited the Long Mynd with the intention of flying. Approximately ten hang glider pilots and thirty paraglider pilots were present. Several of the hang glider and paraglider pilots had brought their partners and children with them. Members of the public also stopped to watch and some entered the field. There were also customers arriving for Air Experience paraglider lessons.

In the morning it was not flyable as the wind was off to the South and very light. But the forecast was for it to veer WSW to W and increase. Paragliders were able to soar from around lunch time, and it became soarable for hang gliders at approximately 4:00pm.

The accident pilot (Pilot A) arrived at the site at about 12.30pm, and rigged his glider. He then chatted with his regular hang glider flying friends and mentors from the Wirral. Conditions improved and Pilot A took off around 4.30pm. He flew for about one and a half hours in a mixture of ridge and thermal lift, making height gains in the region of 3000ft.

At approximately 6.00pm the conditions seemed to be dying off, and several hang glider pilots began organising their landings.

Pilot A overflowed the landing field at several hundred feet from the North, then flew across the front of the site and made a similar overflight from the South. He then flew North along the ridge. A few minutes later he began his approach from the North. He followed a diagonal path to the rear of the road behind the field, flew along parallel to the downwind boundary of the field, then made a turn back across wind to reverse his path. As he approached the field corner heading NNW a second hang glider pilot (Pilot B) was approaching the field heading SSE on a classic crabbing top landing approach. Pilot B was about 75 feet higher than Pilot A.



Picture 1: Pilot A's approximate landing circuit track

Pilot A made a second turn (to the left) outside the corner of the field at approximately 50 feet agl, then entered the field heading cross-wind, still in the left turn.

Pilot A reversed the turn as his final turn at about 20 feet agl. He rolled wings level out of the turn very low, in ground effect and flew into the back of a paraglider pilot who was packing his equipment in the field.

In the impact Pilot A, who was still holding on to the base bar, was rotated head down and thrown forward. The hang glider's nose was also rotated nose down, and this impacted on the rear of the pilot's helmet.

Although the impact was not at high speed, and most witnesses thought it was minor event, it rapidly became apparent that the pilot had suffered serious injury. First Aid was administered and the Emergency Services summoned. Pilot A was then airlifted to hospital.

1.2 Injuries to persons

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

1.3 Damage to the aircraft

The hang glider suffered damage to the left side bottom upright knuckle, which had been forced back into the tail profile of the upright base, consistent with a forward rotational force having been applied to the base-bar.

The nose cone was also reported as damaged: *'Right(?) hand side leading edge bolt had punched through the nose cone, looking like the cause of the rectangular scratch on helmet. Bolt was stuck in the hole, I had to pull the nose cone off the bolt.'*

The pilot's helmet also suffered damage to the rear. This was reported as matching the raised assemblies on the underside of the glider's nose plate. *'Apart from the squashed tailcone, it had light surface scratches (marks on paintwork), as if made by nose wires, and a deeper scratch (through paint into the shell) of approximately rectangular cross-section 1mm deep ~3mm wide, 5-10cm long, behind and slightly above the left ear.'*

Note. The pilot's helmet was lost at the hospital.

1.4 Personnel information

Pilot A:

D.o.B. 02:08:1981 Height: 6'0".

He had qualified with a HG CP Hill rating 1st September 2010. He estimates that he had between 50 and 100 hours experience at the time of the accident.

He had flown the day before the accident at Llangollen and the week before at Worlds End. He had flown and top landed at the Long Mynd on approximately ten previous occasions.

He was known to his friends and family to have natural ability at any activity involving balance and co-ordination. He also rode trials motor bikes. He was waiting for the right day to attempt his first cross-country.

Paraglider Pilot:

The paraglider pilot was a current BHPA member, but held no BHPA pilot ratings.

1.5 Aircraft information

Hang Glider

Moyes Litespeed S4 14.5

The pilot had owned the glider since August 2011. At the time of the accident he had about fifteen hours on the Litespeed, spread over 15 to 20 flights. He commented that he really liked the Litespeed and got used to it really quickly.

Harness

Aeros Viper harness. Pilot A bought his first Aeros Viper harness about eighteen months prior to the accident and flew in it on his previous hang glider. He was on his third Aeros Viper harness at the time of the accident. These harnesses are made to measure, and he bought them second-hand. The first two were sold on when he found them uncomfortable.

The harness used on the accident flight was bought from a rigid wing pilot. After purchase Pilot A discovered that the main suspension strap had been shortened by 3". He therefore flew with an additional hang loop that corrected this, but found that the very low normal hang position with these harnesses made his shoulders hurt through being so close to the base bar – actually touching it during hang checks. So he did away with the extra loop and so was a little higher than most pilots with similar harnesses.

An on-line owner's review of this harness states: *The Viper is a streamlined competition harness with a broad and long carbon back frame. This increases the harness' comfort, but naturally makes it rigid and stiff on the ground. Still, the harness is relatively easy to launch with, and a pleasure to land. The hang loop/bridle is attached to the back frame by a metal slider. During flight the slider is locked in the far end of the slider by a rope from the foot plate to slider, but once the pressure against the foot plate is relaxed, the harness is easy to tilt into a upright position for landing. The harness can be tilting in flight by a butt-lever which is easy to operate.*

+ *It is very easy to get into a very upright position for landing (the slider works well).*

Helmet

Icaro 4fight LT (Long Tail) integral helmet. This is an EN966 certified helmet. It features a one-piece glass-fibre composite shell.



Picture 2: Icaro 4fight LT (Long Tail) integral helmet.

Instruments

Davron 500

12 XC GPS

1.6 Meteorological information

The day was sunny and bright, with scattered cumulus in the afternoon. In the morning the wind was very light south westerly winds 3 to 6 mph. This swung as forecast and increased, becoming west south west around 15mph, occasionally blowing through stronger in thermal gusts. At the time of the accident the wind in the landing area was approximately 10mph WSW.

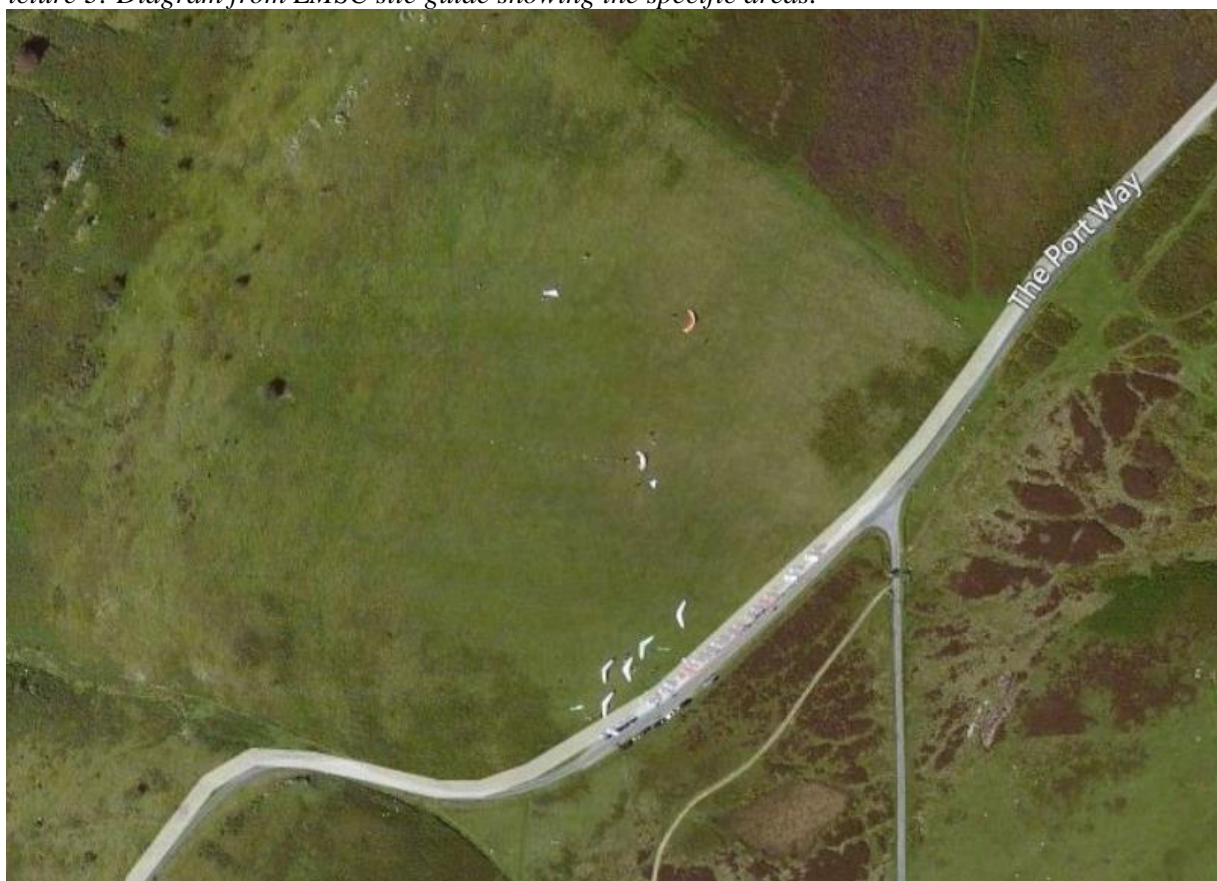
1.7 Aerodrome and approved facilities

The Long Mynd is a Westerly facing inland ridge. The area of land used for hang gliding and paragliding is owned by the Long Mynd Soaring Club (LMSC).

Because the field is used intensively by both hang gliders and paragliders, the LMSC has formalised a site layout to allow safe co-existence. The boundary line between the paraglider area and the hang glider overshoot area is marked by large white markers which can be seen on the satellite image.



Picture 3: Diagram from LMSC site guide showing the specific areas.



Picture 4: Satellite image: the white marker stones run left (West) from the white paraglider in the middle of the photo. (Image not from the day of the accident.)

1.8 Medical and pathological information

Pilot A suffered severe injury to his neck. The investigation has not had access to any X-Ray or medical data. However it is known that the pilot's injuries are in the C6 area near the lower end of the neck.

The paraglider pilot suffered bruising.

1.9 Survival aspects

These are discussed later in Section 2.

1.10 Useful or effective investigation techniques

Three videos of the accident events were obtained. Pilot B had a video camera on his right upright. A pilot de-rigging his hang glider at the side of the field filmed Pilot A's approach on his smartphone, and Pilot A had a video camera on the keel of his glider. This camera detached during the impact, but flew over the glider, rotating end over end. Slowing this video sequence down revealed useful images from in front of the glider.

SECTION 2 – ANALYSIS

2.1 The Collision

The sequence of still shots taken from Pilot A's onboard video camera shows him reconnoitre the field from the North, and then make a circle immediately to the South of the field, before making his actual

approach from the North. Whilst the date and time shown on these images are clearly not accurate, the time difference between the photographs is accurate. This shows that the person in the landing field, whom he was in collision with, was present and within the pilot's field of view for six minutes preceding the accident.

Pilot A has stated that he was not concerned about the group of three people until crossing the Northern boundary fence on his crosswind leg, approximately eight seconds before impact, as he believed that he could easily pass above or to one side of them. He recalls shouting at them to 'Get out of the Way'. (This shout was not heard by the group, nor was it audible on the keel mounted camera recording.)



Picture 5: Pilot A. Reconnoitre from North. Paraglider pilot group ringed.



Picture 6: Pilot A. 360 to South of field. Paraglider pilot group ringed.



Picture 7: Pilot A. Flying to the back of the field from North West. Paraglider pilot group ringed.



Picture 8: Pilot A. First turn behind the field. Paraglider pilot group ringed.



Picture 9: Pilot A. Base leg – crossing into the field. Paraglider pilot group ringed. (It was at about this time that Pilot A states that he shouted a warning.)



Picture 10: Pilot A. Completing final turn. Paraglider pilot group ringed.

Due to an unexpected loss of height the pilot completed his final turn at a height and position which lined him up precisely with the group of three people, and he had no time or space to manoeuvre on final approach to avoid the collision.

He stated. ‘As I straightened up from my final turn I saw that I was going to hit the group of people. I had to correct a slight yaw, and this had me aiming at the man on the left. I had the base bar a foot or so off the ground, and the Litespeed glides a long way in ground effect – probably 100metres. I thought about flaring over the group, but thought my base bar would hit the man in the head. I wanted to hold the

glider back, by jumping through the A frame, whilst knowing this was impossible. I got my feet down and wanted to slow the glider but it was still going quite fast.'



Picture 11: Pilot A. Attempting to slow the hang glider.

2.1.1 Low final turn position discussion.

The factors that could have resulted in the pilot making his final turn at a very low height and directly in line with a group of persons were considered. These are the advanced equipment he was using, the circuit plan he used and the possibility of sinking air in the rear corner of the field.

Glider suitability.

The pilot was flying with competition level equipment. This equipment produces a more efficient (flatter and faster) glide than the equipment a pilot with his experience level would normally be flying. The flatter and faster glide makes the judgement and execution of a landing approach, especially in less strong winds, more demanding. The Litespeed manual states that it has a 15/1 glide angle and 21mph trim speed. This can be contrasted with the Moyes Sonic Intermediate hang glider which has a stated 9/1 glide angle and 20mph trim speed.

The pilot had bought the Moyes Litespeed glider second-hand in August 2011, part exchanging his previous glider, a Moyes Max 157. The dealer involved had been reluctant to sell this advanced glider to an inexperienced pilot, but the pilot stated that he had been advised to get a Litespeed by the two pilots he was flying with and they were very confident that he would cope. The dealer still expressed concern, and asked for a list of gliders the pilot had flown. The list included a K4, which the dealer felt was a good glider to suggest readiness to move on. The dealer has stated that the pilot was very confident in his ability.

It is noted that at least one of pilot A's mentors believed him to have 250 hours experience.

Circuit planning.

The pilot carried out an 'S' turn circuit pattern. The recommended approach for a top landing is the crabbing approach.

'S' turn approaches regularly result in the aircraft being at the correct height in the wrong position or whilst facing in the wrong direction. When the glider is low performance, and the field is wide, then being at the right height in the 'wrong' position is not a problem, as some part of the field will still be in front of the pilot. As the pilot 'S' turns along the downwind side of the field, when his height is correct, he can turn into the field and land straight ahead. This might be on the left side of the field, the middle, or the right side, depending where the glider was when the correct 'turn in' height was reached.

But when, as is the case at the Long Mynd, the landing area is effectively a runway of limited width, then being at the right height in the wrong position is an issue. It is unlikely that the glider will reach the correct 'turn in' height when lined up with the narrow strip, and far more likely that this height will be reached when at some other part of the beat. With higher performance gliders, the 'S' turns are larger. And the likelihood of being in the wrong place increased.

If Pilot A had been higher before he made his final turn, then he would have been able to position the final turn so that he would not roll out of it in line with an obstruction.

If Pilot A had been higher when he made his final turn, then he would have been able to control the glider's speed and direction on the landing approach.

There was ample space for Pilot A to have landed either to the North or South of the group of people. Even with his late recognition of the collision risk, he could have made his final turn earlier or made it slightly less acute and avoided the group.

The pilot has stated that his landing approach progressed more or less exactly as he had planned it, although he lost slightly more height than intended just before his final turn. He is certain that, if he had not found his path obstructed, he would have landed perfectly somewhere near the middle of the landing area.

BHPA recommendations (Pilot Handbook Chapter 11) are that the pilot should complete turning finals at *about 30 m (100 ft) up, into wind, wings level, and the right distance back from your chosen landing area taking into account the conditions and glider type (well back in light winds, less so in stronger winds)*. Pilot A completed turning finals at about 3m (10ft).

One witness commented: *'I could see that it was not a very good approach as it seemed low and (he) was making quite a steep late turn.'*

Overshooting

Given his high-performance equipment and the light wind conditions, Pilot A would have been conscious of the risk of over-shooting. (He had apparently made five consecutive over-shoots during a flight on a previous date at the Long Mynd, before landing successfully.) In avoiding this he ended up too low. Normally an overshoot is a simple, safe procedure. But in light winds it is usually followed by the inconvenience of a bottom landing.

I briefly considered making a bottom landing, but concluded that this would be at least as difficult. The bottom landing field is not very big, and is slightly crowned, so slopes away. And it would have been nil wind down there. On a high-performance glider making a safe landing there would have been difficult. Also I couldn't remember the recommended landing approach into the field.

It is noted that Pilot B, flying a very low-performance hang glider, did overshoot his top landing and this resulted in a bottom landing. After a cramped approach he managed to stop his low-performance hang glider a few metres short of the far hedge.

Vb setting.

An over-tight Vb setting would reduce the manoeuvrability of the hang glider. Examination of the video shows that Pilot A reset his Vb to approximately 1/4 travel six minutes before impact. It remains in that setting up until impact. Other pilots of this glider type report normally landing with 1/4 or 1/3 Vb applied and that this gives the optimum handling. So the Vb setting does not appear to have been a factor.

2.1.2. Influence of the second hang glider discussion.

Consideration was given to the question of whether the presence of the second hang glider led to Pilot A compromising his landing approach.

One witness reported that Pilot A had *deviated to his left very intentionally* after crossing the northern boundary fence, and that this was probably due to the presence of a second hang glider (flown by Pilot B) coming in to land on Pilot A's right. However, Pilot A's recollection is that he was totally unaware of this second pilot.

Close examination of Pilot A's on-board video footage show no extra change of course in between the turn before crossing the fence and the final turn, although the two turns (left then right) actually run into one another with no intervening period of straight flight. It is also noticeable that the pilot's head is pointing towards his landing area throughout this sequence and never turns in the direction of the second glider. The second glider was significantly higher than Pilot A and would have been in a position where a pilot focusing on low turns would not have been looking. It is quite possible that the glider's nose and / or the pilot's raised visor would have obscured this part of the sky.



Picture 12: Pilot A. At this point the second glider flown by Pilot B was directly in front of and considerably higher than Pilot A. Pilot A's attention is focused across and down to his left.

Pilot B turned cross-wind before reaching the back of the field, in order to avoid overflying Pilot A. He then made his final turn to line up into wind over the hang glider overshoot area. He touched down with one foot, but was on sloping ground and was forced to overshoot. He subsequently made a safe bottom landing. The two gliders were never closer than 100feet apart.



Picture 13: Picture from Pilot B's glider as he crabs towards the field NE corner. Pilot A circled.



Picture 14: Picture from Pilot B's glider as he crabs towards the field NE corner. Pilot A circled.



Picture 15: Picture from Pilot B's glider as he crabs towards the field NE corner. Pilot A circled.

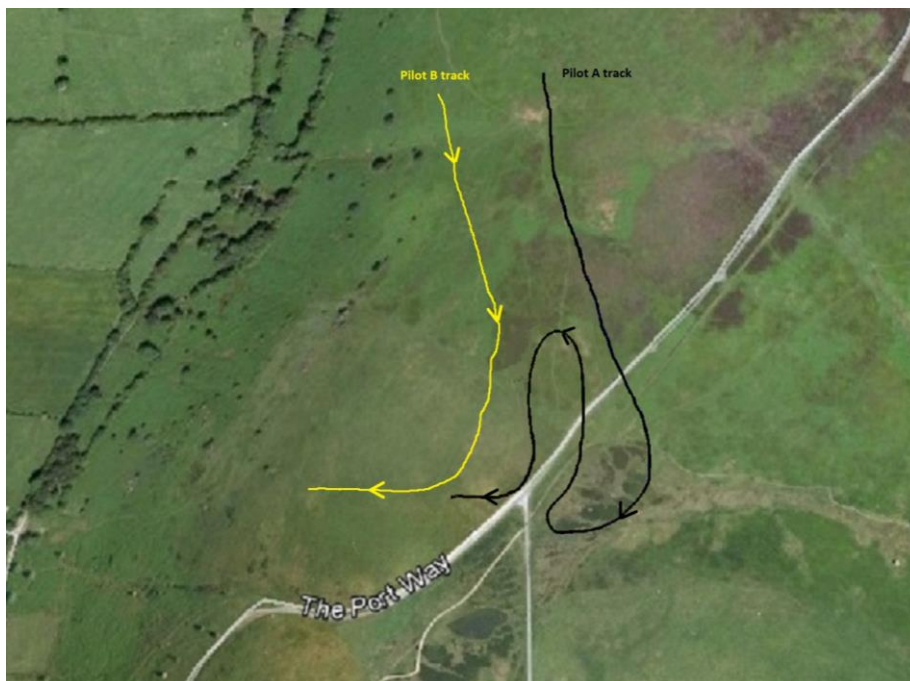


Picture 16: Picture from Pilot B's glider as he crosses the Northern boundary fence. Pilot A circled.



Picture 17: Picture from the ground. Pilot A in upper centre of picture. Pilot B's wing tip circled.

Whilst there is no evidence that Pilot A was aware of the presence of Pilot B, the possibility that he had spotted him whilst behind the road remains, and it is possible that Pilot A tightened his left hand turn to improve separation. Tighter turns use more height, and would have meant that his final turn also had to be tighter.



Picture 18: Pilot A's approximate landing circuit track in black. Pilot B's approximate landing circuit track in yellow.

Pilot B was performing a conventional top landing approach (as recommended). Pilot A was performing an S turn approach.

The S turn approach used by Pilot A also almost certainly produced a situation where Pilot A and Pilot B were flying towards each other just to the North of the field, as Pilot B headed SE on a curving downwind leg from the ridge, and Pilot A headed back NW from his first turn at the back of the field. Having aircraft flying in opposite directions in a landing circuit is undesirable. Pilot A believed that, as he was already involved in making his 'S' turn landing approach, it would be poor airmanship for any other glider to commence an approach. (Note. Whilst ideally only one hang glider would be on approach at any time, at most busy sites it is normal and necessary for several gliders to be able to approach at the same time. This is easily and safely accomplished if they all fly a predictable approach path in the same direction.)

2.2 The Injury

The pilot sustained serious injuries in the impact sequence. The prone flying position used in hang gliding does expose the neck to injury, and hang glider pilots have suffered serious neck injury in other accidents involving apparently minor impacts. But in this accident a still shot from the video shows that the pilot was struck in the back of the head by the glider's nose plate. This is a new phenomenon and was investigated further.

Glider and Harness design

Modern high-performance hang gliders have reduced centre-section chord, which means that the distance from the hang point to the nose plate is less than in previous designs. This was identified as an important factor.

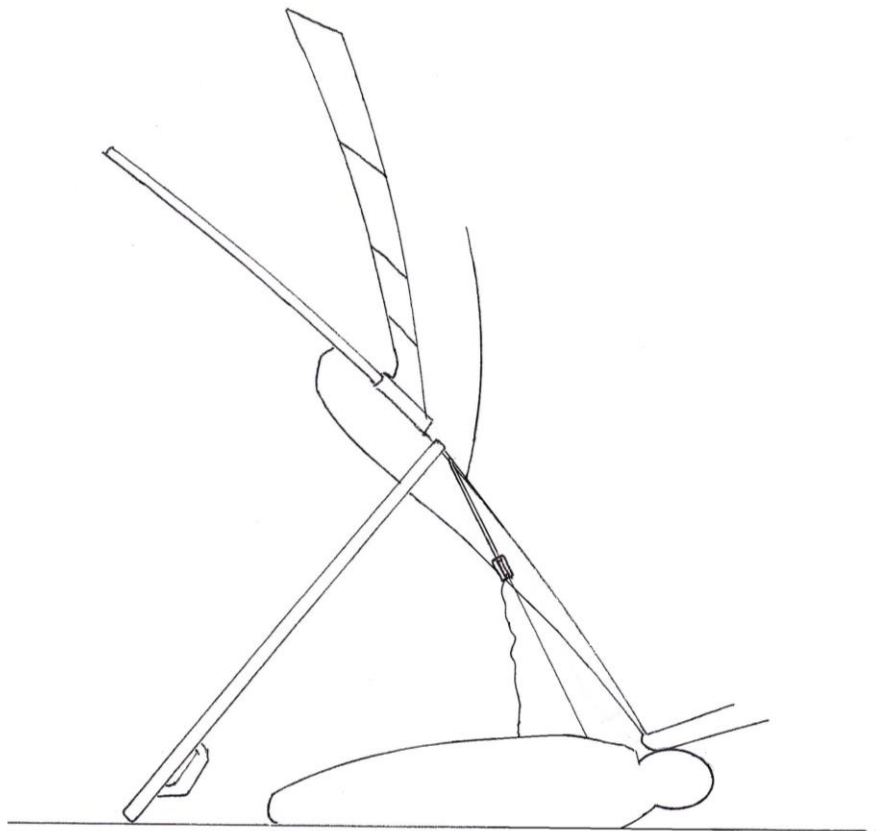
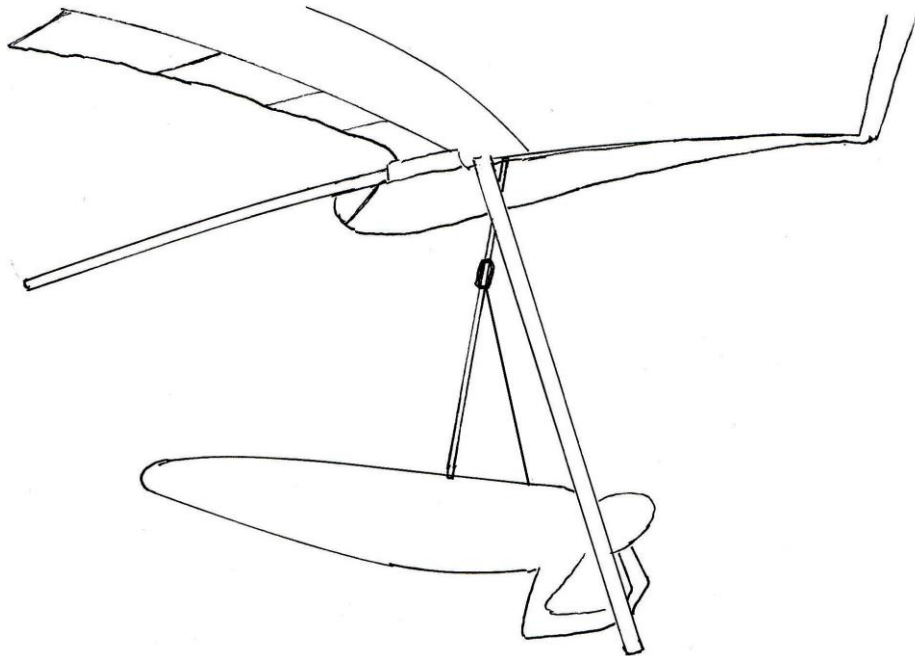
Attention then focussed on the harness design. This harness, like various other modern performance-orientated 'single hang strap' designs, was found to allow the pilot to get his head in front of the glider's nose in an accident.

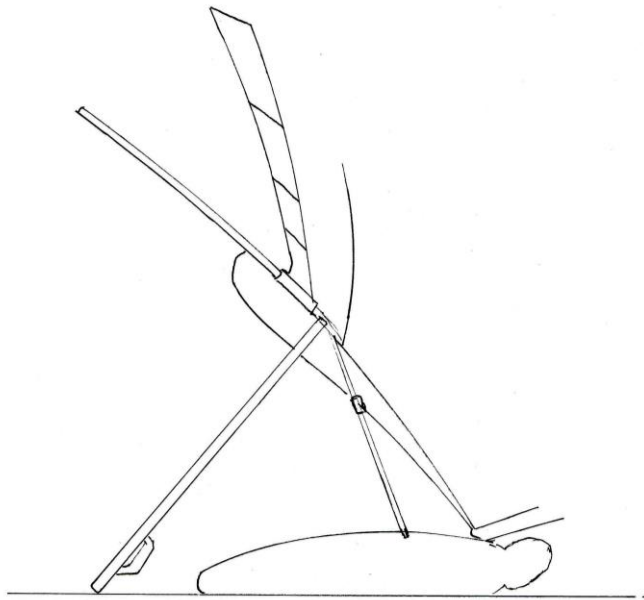
An additional possible factor is that these 'single strap' harnesses incorporate a tilt angle adjustment mechanism – in the case of the Aeros Viper harness this is activated with a 'butt lever'. A tilt limit cord is held in a cleat within the harness, behind the pilot's back. When the pilot raises his backside the 'butt lever' releases the cord and allows it to move, until the pilot lowers his backside, when it relocks. These tilt angle adjustment mechanisms are designed to handle the small loads involved in holding the tilt angle, and are known to slip when the components get worn. Under the 'g' loads involved in an accident such as this one, it is considered likely that the tilt angle adjustment cord would slip, allowing the pilot's head to move even further forward under the glider's nose.

Another trend over the past ten years has been for pilots to hang lower, resulting in a longer hang strap.



Picture 19: Aeros Viper harness showing tilt angle adjustment cord.





Picture 20: Diagram illustrating the range of movement possible with this glider / hang strap / harness geometry. (Final picture show result if tilt angle cord slips under crash load.)

Further research revealed that other harness types, including those with shoulder straps, also allowed the pilot's head to project in front of the glider's nose when tried with high-performance (high aspect-ratio) glider types.

The investigation collected data from other hang glider associations, and found that the injury and causal mechanism (glider's nose hitting the pilot's head) was previously unheard of. Given that these glider and harness combinations had been in use for around ten years, and that in those ten years there have been numerous instances of landing incidents and crashes, it was difficult to identify what particular feature had resulted in this outcome in this accident. Normally in a landing incident or crash, the nose impacts the ground ahead of the pilot.

Eventually two previous events were found where the pilot's head had got in front of the nose in a landing incident. The common unusual feature in all three events was that the pilot was landing with his hands on the base bar. Analysis showed that the likelihood of the pilot's head getting in front of the nose is significantly increased if the pilot has his hands on the base bar during the initial impact. The pilot is likely to rotate head down around his hands, and there is then no impediment to his forward progress. If the pilot had his hands on the uprights, then the tendency in an impact is for his upper body to be restrained and for his head to be up. Even if he is propelled in front of the uprights, the pilot is then likely to impact into the underside of the glider.

Making landing approaches and even landings whilst on the base bar is a relatively recent pilot innovation, based initially on harnesses that were particularly badly designed and hard to get into an upright position. This landing style has continued to be quite common amongst younger pilots, despite there being no difficulty in getting upright with harnesses like the Viper.



Picture 21: Pilot A: Slider fully back, hands on base bar



Picture 22: Corresponding external view of picture 21.



Picture 23: Pilot A: The moment the slider moves forward, shoulders up, hands still on base bar



Picture 24: Corresponding external view of picture 23.



Picture 25: Pilot's hands on base bar during impact. (This image has been distorted by the speed of rotation of the camera.)

BHPA recommendations (Pilot Handbook Chapter 11) are that the pilot should complete turning finals and that the pilot should then [snip] • *Move your hands to the uprights, level with your head.*

Cause of injury

It is known that the pilot suffered serious injury to his neck in the accident.

The puncturing of the nose cone indicates that the glider's nose came down with considerable force and hit the rear of the helmet. This may have driven the helmet tail into the vertebrae. Whether the glass-fibre helmet 'tail' would have spread, absorbed or concentrated this force is a matter of conjecture. Other possibilities are that the glider nose's impact with the helmet led to a twisting injury, or that the top edge of the carbon fibre back plate in the harness was driven into the area during the impact. Or that the damage was caused by the pilot's body continuing forward after the pilot's head had impacted the ground. However, the pilot clearly recalls feeling a sharp blow to the back of his head, and given that the video still clearly shows the glider's nose down in this area, the helmet tail being driven into the neck seems the most likely explanation.



Picture 26: Pilot A: Hang glider nose down behind pilot's head.

2.3 Landing approaches with modern high-performance hang gliders.

The hang glider landing approaches at the Long Mynd were established sometime around thirty years ago, when hang gliders had an 8/1 glide angle, perhaps 10/1 glide at best. Glider performance has continued to improve, whilst the size of the landing area has remained static – or has in fact shrunk, as the available area is now divided into hang glider and paraglider areas. Thirty years ago virtually the entire area inside the fence was available as a hang glider top landing area: now only about half of the area is available. In easy soaring conditions (18mph plus) the increased difficulty is masked by the low forward ground speed. But in lighter wind conditions – as experienced at the time of this accident - it becomes important. The hang glider pilot needs to arrive, pointing in to wind, in the hang glider landing ‘strip’, low enough to avoid an overshoot. The actual area in which a safe landing is possible measures approximately 200feet by 150feet. Undershooting puts the hang glider dangerously close to the vehicles parked on the roadside, the fence, and the dead air zone. To the left (South) the ground slopes away into the gully with the road. To the right (North) is the ‘Paraglider Only’ zone. And in front the land slopes away.

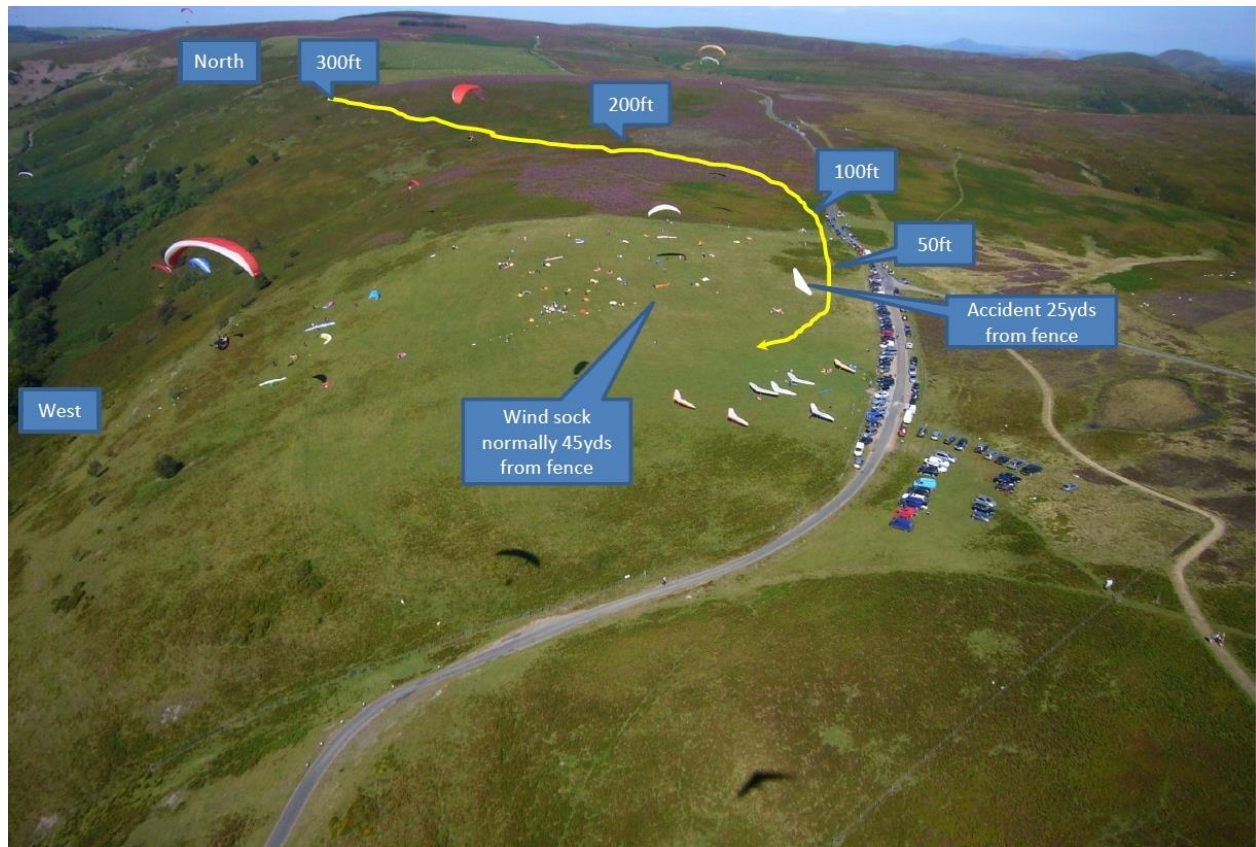


Picture 27: The actual usable hang glider top landing area.

The landing approach is flown at somewhere around the glider's max glide speed (approx. 30mph), with the harness open and the Vb slack. So the maximum glide angle of 15/1 may be degraded to 10/1 by these factors. With ten feet excess height the glider will fly another 100 feet forward. Given a 10mph headwind this will be reduced to 66feet. But in ground effect, the distance will be extended. So the pilot aiming to land in the target area must make his approach within ten feet of the optimum height, with his airspeed no higher than max glide speed. This can be contrasted to the situation faced by sailplane, microlight or light aircraft pilots at any normal flying site, where the approach height needs to be within 100 feet either side of the optimum and the height can be easily controlled with airbrakes or throttle. Top landing an advanced hang glider in light winds at the Long Mynd is an undertaking that requires a great deal of skill and judgement.

A good flight plan for a top-landing approach in lighter conditions with a high performance hang glider would involve the HG pilot turning finals behind the road at 100 feet, crossing the road (in the landing position) at twenty feet and stopping somewhere around the middle of the field. However, the land at the Long Mynd falls away behind the landing area and the descending air has claimed many hang glider uprights in the past. This history almost certainly applies to hang gliders approaching in stronger winds, where rotor and dead air areas would be more pronounced. But this, and the fact that there are generally cars parked alongside the road (which is in use), has meant that a tracking approach above or slightly in

front of the road is the norm – which therefore requires a low final turn (~ 40 feet) and short final approach. (The final turn is through considerably less than 90 degrees, which is beneficial.)



Picture 28: Normal top landing approach at the Long Mynd (Note. Picture is not from the day of the accident.)

2.4 Control of the site

Persons in the landing area.

The collision took place at a position within the designated combined paraglider / hang glider landing area.

The persons in the landing area were a paraglider pilot, his girlfriend and young child. The paraglider pilot had landed in this position, but when collapsing his wing he had inadvertently hooked the handle of his underseat emergency parachute and that had fallen out, in its pack. He then could not move without risking deployment of the emergency parachute. Because of this difficulty he had called his girlfriend over, by radio, to help him sort this out and pack away. (Normally a paraglider pilot should bunch up his paraglider after landing and move to a packing area.) He was in the very final stages of packing everything into the rucksack, bending over facing west, when he was hit in the backside by the hang glider's base bar corner / right flying wire.

The video from Pilot A's glider shows the landing area when he completes 360⁰ turns. Using the camera timings, on a 360 at 01:55:57 the paraglider is not on the ground. The next time Pilot A completes a 360⁰ turn is at 01:57:52 and the paraglider is on the ground. The collision is at 02:06:00, by which time the paraglider is almost fully packed away. The paraglider pilot had therefore managed to virtually complete packing his equipment in about nine minutes. It would not be unusual to spend fifteen minutes or more packing a paraglider away, without the extra complication of the dislodged emergency parachute.

It is also clear from the footage from the onboard camera that a very different accident was narrowly avoided by the mother pulling her young child (toddler) back to safety. Even so, the corner of the glider's control frame passed in line vertically and approximately a metre horizontally away from the toddler's head, at flying speed.



Picture 29: Mother snatches toddler back.

Non pilots.

Approximately sixty vehicles were parked at the site. Given that it was a Bank Holiday weekend and that many people would have their partners with them, it seems reasonable to assume that somewhere around one hundred people were present, of which approximately forty were pilots as previously identified. This means that there was somewhere in the order of sixty non pilots present – although some cars could have belonged to hill walkers, which would reduce that number.

The LMSC has several warning notices on the fence and gate (See Appendix) stating that the site is a private active flying site, and detailing site rules. Several witnesses have commented on members of the LMSC and Mercian Club moving non pilots from active areas of the field during the day. The photographs taken on this day and a previous busy day show a high level of adherence to the site operating plan.

Pilot A, Pilot B and the paraglider pilot were not members of the LMSC.

2.5 Missing evidence and statements.

This report has been compiled from the evidence available. It is noted that the following items were not available:

GoPro camera on Pilot A's right upright.

Helmet

Logbook

Medical report/analysis

SECTION 3 – CONCLUSIONS

The investigation found that the pilot suffered serious injury after colliding with a stationary person within the landing area during the landing phase. Contributory factors were the wind dropping off, use of the 'S' turn approach method, the use of advanced equipment, use of a base-bar landing technique, site topography and layout, the harness and glider design and the presence of a group of three stationary people.

SECTION 4 - SAFETY RECOMMENDATIONS

The FSC should warn hang glider pilots of the dangers of prone landing approaches.

The FSC should draw attention to this accident with the intention of stimulating the development of equipment that would protect against the danger of the nose plate impacting on the pilot in an accident.

APPENDIX

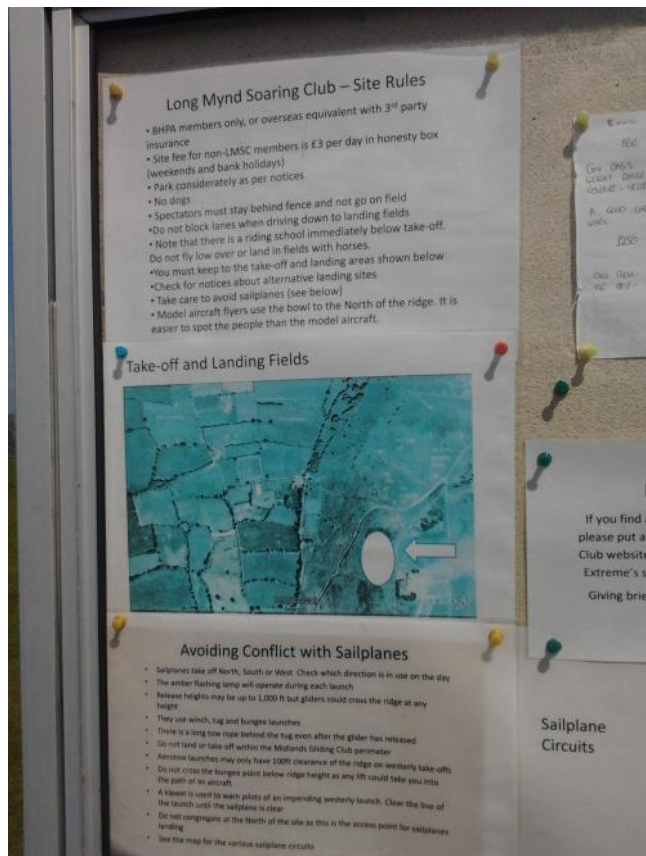
Current LMSC signs



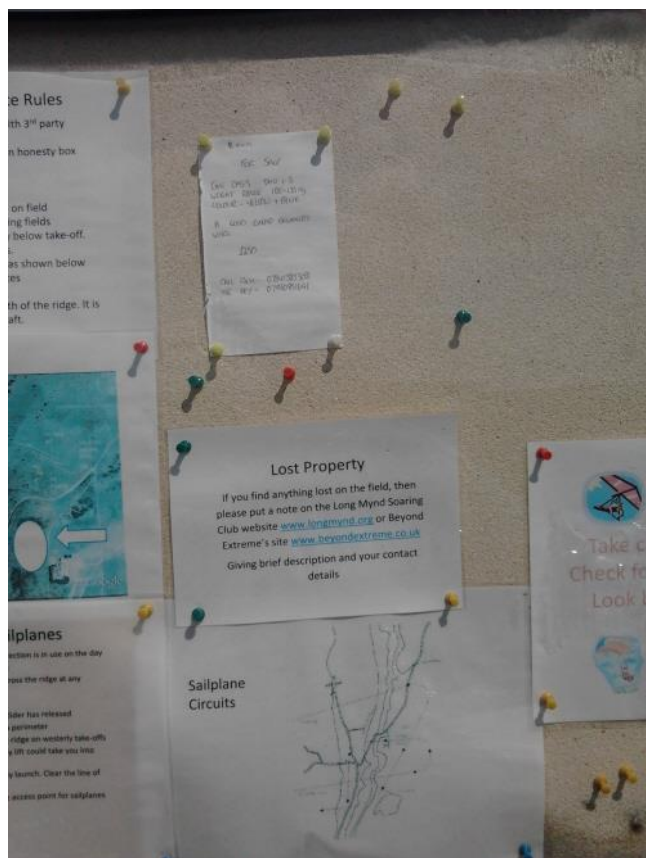
Parking area signs



Sign on entrance gate



Noticeboard 1



Noticeboard 2



Noticeboard 3



Viewing area sign - pointing people to viewing areas outside of field