

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Head AX8-88B hot air balloon, G-TIMX	
<b>No &amp; Type of Engines:</b>	N/A	
<b>Year of Manufacture:</b>	2008 (Serial no: 384)	
<b>Date &amp; Time (UTC):</b>	20 April 2021 at 0905 hrs	
<b>Location:</b>	Welton, Daventry, Northamptonshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 2
<b>Injuries:</b>	Crew - None	Passengers - 1 (Serious) 1 (None)
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	32 years	
<b>Commander's Flying Experience:</b>	407 hours (of which 70 were on type) Last 90 days - 4 hours Last 28 days - 4 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

**Synopsis**

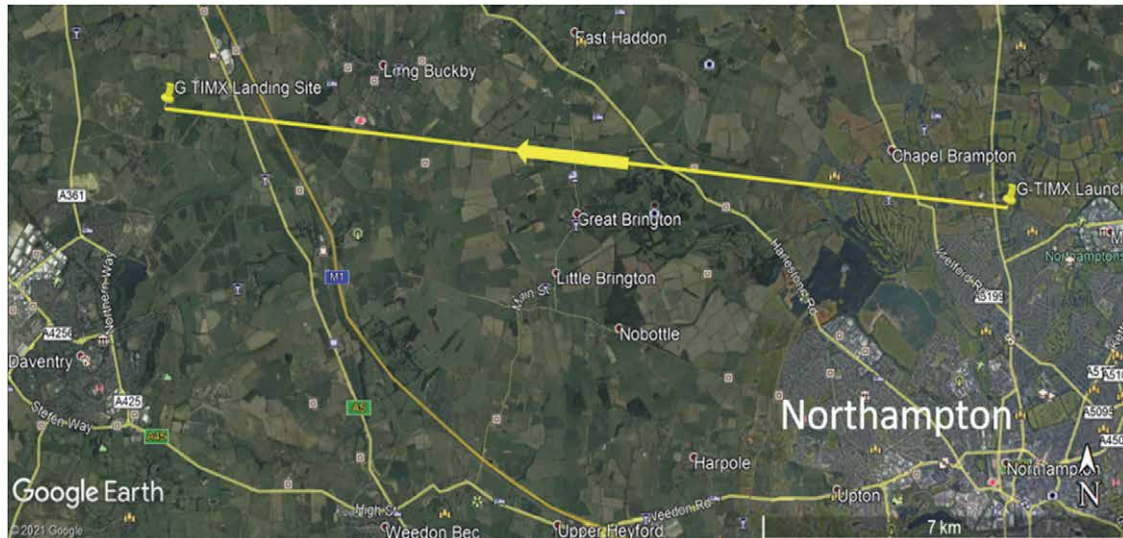
While approaching to land the pilot chose to fly the balloon into contact with a hedgerow to reduce speed for touchdown. During the landing one passenger suffered a serious lower leg injury.

**History of the flight**

The pilot and passengers met at the recreation ground from which takeoff was planned. Before the balloon was inflated the pilot gave both the passengers a safety briefing and explained the brace position to be adopted for landing, which was to face sideways holding the rim of the basket and with knees bent. The pilot had obtained a weather forecast which indicated a wind between 5 and 10 kt varying in direction from 060° to 120°. There were only small amounts of cloud, at altitudes above 4,000 ft amsl, and the visibility was greater than 10 km. The maximum windspeed for takeoff is 7 mph (6 kt) and the maximum windspeed for landing is 12 mph (10 kt) so the weather conditions were suitable for flight. The approximate route is shown in Figure 1.

The inflation was normal, and the balloon took off at 1830 hrs. During the flight the balloon generally flew at altitudes between 800 ft and 1,500 ft amsl and reached a maximum of 2,000 ft amsl to allow for a fuel cylinder change over. The pilot stated that on two occasions he descended the balloon close to the ground to assess the low-level wind that

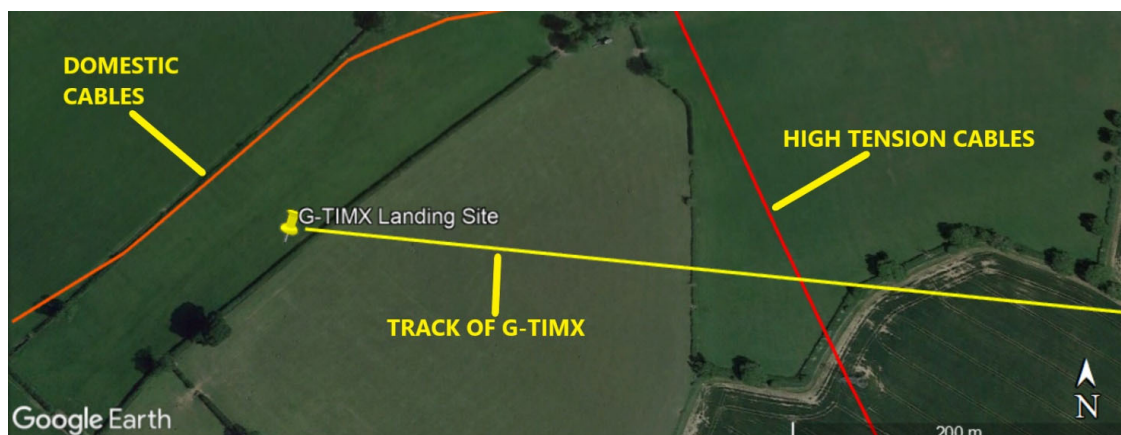
would affect the landing. On both occasions he assessed the low-level wind as within limits for landing.



**Figure 1**

Approximate track of the balloon

As the balloon approached the M1 motorway the pilot was preparing to select an area for landing. He discounted an area of fields adjacent to and west of the motorway due to the presence of a horse and concerns that the balloon crossing the road at low-level would constitute a distraction for drivers. Just west of the motorway there is a set of high-tension electricity cables and the pilot decided to land to the west of these. Many of the fields were planted in crop and to avoid damage to crops the pilot chose a narrow grass field. The western edge of the field was bounded by low, domestic electricity cables, so the pilot intended to land in the first quarter of the field to allow room for the balloon to deflate without becoming entangled in the cables. The landing site is shown in Figure 2.



**Figure 2**

Landing site

Before crossing the high-tension cables, the pilot warned the passengers that he was preparing to land and that they would be told when to adopt the brace position for touchdown.

After crossing the high-tension cables, the pilot descended to approximately 80 ft agl. His handheld GPS indicated a groundspeed of 8 to 9 kt, which was below the limit for landing. As the balloon approached the chosen landing field the pilot instructed the passengers to adopt the brace position. The eastern side of the landing field is bounded by a hedgerow and the pilot decided to allow the balloon basket to make contact with this to reduce the groundspeed for touchdown. The hedge and landing area are shown in Figure 3, which shows a view looking upwind. There were fence posts embedded in the hedge which were not visible to the pilot.

He reduced the height of the balloon to bring the basket level with the top of the hedge and made contact as he intended. One passenger described the impact with the hedge as “hard” and believed it dislodged her from the brace position. As a result, the passenger did not believe she was in the planned brace position when the basket struck the ground. The wind then carried the balloon past the hedge pulling the basket clear and it dropped approximately one metre into the field. The pilot described the touchdown as a “small bump on the landing which is normal and expected with the wind conditions”. During touchdown the basket fell onto its side and the balloon then deflated normally.



**Figure 3**

Hedge and fenceposts bordering landing site

After landing, one of the passengers complained of pain in her ankle. The pilot, a trained first aider, recognised from the deformity in the passenger's ankle that it was broken. He called for an ambulance but was told that, due to a road traffic accident on the M1 motorway, no ETA could be given for an ambulance and that he should wait for a clinician to call back. After 30 minutes no call back had been received by the pilot. Due to the failing light and the pain the passenger was suffering the pilot carried out first aid in the field. Then, with the assistance of the balloon's ground party, the passenger was carried to a private motor vehicle and driven to hospital where the injuries required surgical intervention.

### **Aircraft information**

The balloon is a Head AX8-88B. It has a 90,000 ft<sup>3</sup> envelope with a diameter of 57 ft, and when inflated is 72 feet 8 inches tall, including the basket. An image of the balloon is shown in Figure 4.



**Figure 4**  
Head AX8-88B

### **Fast landing technique**

The British Balloon and Airship Club (BBAC) Pilot Training Manual contains a chapter on technique for landing at speeds above 8 kt. It recommends bringing the balloon very low across the landing field so that there is little or no vertical velocity then opening the balloon rip panels to release hot air and so rapidly reduce buoyancy. The balloon basket should then slow down rapidly due to friction with the ground. The manual does not suggest using

a planned collision with trees or hedges to reduce touchdown speed. This technique is, however, widely discussed and accepted amongst the hot air balloon community.

The CAA Flight standards Officer (Balloons) (CAA FSO) was consulted with regard to fast landing techniques. In their view, using planned collision with trees or hedgerows to decelerate is likely to introduce more challenges than benefits and has limited effect on reducing groundspeed. A particular risk is judging how severe that collision is likely to be, due to the unknown strength of the object into which the balloon will collide. The CAA FSO believed the technique described in the BBAC Pilot Training Manual to be more appropriate.

### **Analysis**

During flight the pilot made two descents to low-level to assess the wind conditions for landing. The forecast and the actual wind were within limits for operation of the balloon, the 9 kt shown by the pilot's GPS equates to 10.5 mph against a limit of 12 mph. The passengers had been briefed before flight by the pilot on an appropriate brace position for landing. The pilot chose a landing side which avoided livestock, causing a distraction on the M1 motorway, and landing in crops.

As the balloon approached the landing site the pilot told the passengers to adopt the brace position for landing and warned them of his intention to allow the balloon basket to touch the hedgerow to reduce landing speed. This manoeuvre was executed successfully, but the passenger described the contact with the hedge as being sufficiently hard as to dislodge her from her prepared brace position.

As the wind carried the balloon past the hedge, the basket swung down into the field from a height of approximately one metre. While the landing was described by the pilot as no more severe a touchdown than expected for the conditions, if the passenger was dislodged from her brace position during the collision with the hedge, it is likely that she was not correctly braced for the touchdown and the likelihood of injury during landing was greater.

It is difficult to assess the hazard posed by the possibility of solid obstructions within a hedge line and so CAA FSO considered that the fast landing technique as described in the BBAC Pilot Training Manual would have been preferable.

### **Conclusion**

It is likely that the passenger was disturbed from her planned brace position as a result of the contact with the hedge. Accordingly, she was not correctly braced for the touchdown and suffered a serious injury.