

Helmets in GA Flying

References / Extracts:

UK AAIB

Stampe G-BIMO
[Fatal x 2]

[http://www.aaib.gov.uk/cms_resources.cfm?file=/Stampe%20SV4C%20\(Modified\).%20G-BIMO%2005-11.pdf](http://www.aaib.gov.uk/cms_resources.cfm?file=/Stampe%20SV4C%20(Modified).%20G-BIMO%2005-11.pdf)

Survivability

The pathologist who conducted the post-mortems reported that:

'Using the helmet without the liner would significantly reduce the protection the helmet would afford against impact-related deceleration, although it is uncertain as to the effect on survivability this would have had in this particular accident.'

UK AAIB

Yak 52 RA01337
[Fatal x 2]

http://www.aaib.gov.uk/cms_resources.cfm?file=/Yak-52.%20RA%2001337%2007-94.pdf

The post mortem examination revealed that both occupants received fatal injuries as a direct result of the accident and that their chances of survival, the rear seat pilot in particular, would have been greatly enhanced had the harnesses/attachments not failed and head protection been worn.

UK AAIB

Yak 52 G-YAMS
[Injury x 1]

http://www.aaib.gov.uk/cms_resources.cfm?file=/G-YAMS_5-05.pdf

Survivability

Due to the deceleration forces during the landing, with the aircraft stopping in a very short distance, the pilot sustained serious injuries despite wearing a five point harness and a helmet. His head had struck the top of the instrument panel with sufficient force to put a split in the helmet and he sustained serious chest injuries from the harness. However, had he not been wearing the helmet or the harness, it was considered that this accident would most likely have resulted in fatal injuries.

UK AAIB

Yak 52 LY-AFB
[Minor x 1]

http://www.aaib.gov.uk/cms_resources.cfm?file=/dft_avsafety_pdf_500708.pdf

He made the observation that, although the 5-point harness had saved him from more serious injury, the minor bruising to his head would not have happened if he had worn a helmet.

UK AAIB

Extra 300 G-ZEXL
[Nil Injuries]

http://www.aaib.gov.uk/cms_resources.cfm?file=/Extra%20EA%20300%20L.%20G-ZEXL%2002-09.pdf

Synopsis

An unsecured fuselage panel detached during a maximum energy manoeuvre. The panel struck and destroyed the canopy and caused damage to the aircraft. The pilot was protected effectively by the use of a helmet.

Use of protective headgear

The pilot, who was occupying the rear of the two tandem seats, was wearing a full 'bone dome' style helmet. Following the incident, the helmet had witness marks from contact with the Perspex canopy as it shattered. It is likely that the use of this helmet protected the pilot from a significant head injury.

UK AAIB

Isaacs Fury
G-BZAS

http://www.aaib.gov.uk/cms_resources.cfm?file=/Isaacs%20Fury%20II.%20G-BZAS%2012-09.pdf

The pilot lost control of the aircraft during landing and it departed the runway, coming to rest inverted. He was uninjured and was able to vacate the aircraft unaided. The pilot, who is experienced on other tailwheel aircraft, commented that the varying wind direction and his unfamiliarity with this aircraft type were contributory factors. Although he usually wore a helmet, he did not on this occasion, as the microphone on his helmet was unserviceable. He considered himself fortunate to have escaped injury and he intends to wear a helmet in future whenever flying in open cockpit aircraft.

UK AAIB

Extra 300 G-IIEX

http://www.aaib.gov.uk/cms_resources.cfm?file=/Extra_EA_300-L_G-IIEX_08-09.pdf

The pilot's helmet exhibited a number of areas of substantial impact damage and the visor had fractured in two. Red smears on the front left of the helmet corresponded with the colouring of the canopy release handle, which had broken off. Cuts in the leather sheath on the diagonal bracing tube at the left forward corner of the cockpit were consistent with the effects of a strike by the helmet and visor. Impact markings on the left rear of the helmet indicated that it had forcibly contacted a vertical steel tubular A-framework located just behind the normal head position.

Survivability issues

Advice was obtained from a biomedical specialist from the Royal Air Force (RAF) Centre for Aviation Medicine (CAM) at RAF Henlow, who examined the aircraft after its removal from the site and who provided a report on occupant crash injury aspects. The pilot in the rear cockpit was wearing a H1SL Alpha helmet; the passenger in the front cockpit was not wearing a helmet. G-IIEX's pilot sustained a fractured left wrist and a cut to the forehead. The specialist concluded that the pilot had initially flailed forwards and to the left, causing the helmet strike on the canopy release handle and the left bracing tube. He then flailed backwards, causing the helmet strike on the A-frame. The specialist noted that the helmet was designed to conform to British Standard BS6658 (with reservations), which is similar to that worn by UK military fast-jet aircrew and affords the same protection standard. He judged that, while the impacts may have caused the pilot to lose consciousness, the helmet had prevented significant head injury.

The specialist judged it likely that the skull fracture would have been less serious, or even prevented, had the passenger been wearing a helmet.

The CAM report concluded that:

'if similar injuries are to be prevented in similar circumstances in future accidents, it should be recommended that protective helmets should be worn by both the front and rear seat occupants...'

UK AAIB

Extra 300 G-DUKK
[Fatal x 1]

http://www.aaib.gov.uk/cms_resources.cfm?file=/Extra%20EA300L,%20G-DUKK%2002-11.pdf

The pilot suffered a fatal head injury when the tubular structure retaining his shoulder harness failed and his head struck the instrument panel. However, the impact loads were significantly in excess of the certification requirements for the pilot restraint system. The pilot was wearing a headset but no helmet. It is possible that had he been wearing a helmet, the severity of his head injury would have been reduced, but it was not possible to determine whether this would have been to a degree sufficient to alter the fatal outcome. Furthermore, the main impact was to the pilot's forehead, and in an area for which most flying helmets do not provide impact protection.

UK AAIB

Taylor Monoplane
G-BDEV
[Nil Injury]

http://www.aaib.gov.uk/cms_resources.cfm?file=/dft_avsafety_pdf_502136.pdf

...he was too late to prevent the aircraft stalling and crashing inverted onto the trees. The pilot ascribed his lack of serious injury to the fact that he was wearing a four-point harness and crash-helmet with visor.

UK AAIB

Pitts S-1C
G-SWUN
[Nil Injury]

http://www.aaib.gov.uk/cms_resources.cfm?file=/dft_avsafety_pdf_033339.pdf

The aircraft suddenly and violently ground-looped to the right, the left lower wing tip and propeller striking the ground as it did so. The aircraft then pitched rapidly over its nose and came to rest inverted with the stern post taking most of the aircraft's weight. ... He also believes that his good quality five-point harness and the wearing of a crash helmet were significant in protecting him from injury.

**CAA Safety Sense
Leaflet 19**

<http://www.caa.co.uk/docs/33/20110217SSL19.pdf>

Particularly when flying open cockpit aeroplanes, a lightweight helmet gives protection while minimising discomfort under increased 'g' loadings.

Guardian

Rob Davies
Interview
P-51 Midair Duxford

<http://www.guardian.co.uk/lifeandstyle/2011/aug/12/i-crashed-vintage-plane/print>

There was a deep gouge in my flying helmet – evidently, my head had bounced off the tail as well.

UK AAIB

http://www.aaib.gov.uk/cms_resources.cfm?file=/P-51D%20Mustang%20D-FBBD%20and%20%20Douglas%20AD-4N%20Skyraider%20F-AZDP%2002-12.pdf