

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	CZAW Sportcruiser, G-MELL	
<b>No &amp; Type of Engines:</b>	1 Rotax 912ULS piston engine	
<b>Year of Manufacture:</b>	2010 (Serial no: LAA 338-14866)	
<b>Date &amp; Time (UTC):</b>	17 May 2014 at 1230 hrs	
<b>Location:</b>	3 miles south-east of Westcott, Hertfordshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - None
<b>Injuries:</b>	Crew - 1 (Minor)	Passengers - N/A
<b>Nature of Damage:</b>	Damage to canopy, tailplane, elevator and flaps	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	63 years	
<b>Commander's Flying Experience:</b>	517 hours (of which 156 were on type) Last 90 days - 9 hours Last 28 days - 5 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB and Light Aircraft Association	

**Synopsis**

The aircraft was engaged on an air test to check its handling at the Never Exceed airspeed ( $V_{NE}$ ). Some 13 kt below this speed, there was a bang and the aircraft started to oscillate violently in pitch. The pilot noticed that the canopy had fractured and a fire extinguisher had become loose in the cockpit. With the speed reduced considerably, the pilot regained control and he continued to his destination.

After an uneventful landing, it was found that the tailplane had buckled on both sides and appeared close to complete failure. The Light Aircraft Association (LAA) is conducting a structural review of the tailplane.

**History of the flight**

The aircraft was being flown from Chilsfold Farm, West Sussex, to the area of Westcott in Hertfordshire where completion of an air test would be carried out before it landed at its home airfield of Elstree. About 2-3 miles from Westcott, the pilot climbed the aircraft to 3,000 ft agl to accomplish the last part of the air test, which was a dive to  $V_{NE}$  (in this case 138 kt) to check both the aircraft's handling and that the propeller did not overspeed.

He dived from 3,000 ft, keeping a careful watch on the airspeed indicator, altimeter and engine tachometer whilst keeping his hand on the throttle to prevent overspeed of the engine and propeller. At an IAS of 125 kt and height of 1,700 ft, there was a loud bang and

the aircraft started to oscillate in pitch violently. The pilot was also aware that the canopy had fractured and that papers and other small objects were flying around the cockpit. His attention was focussed on trying to overcome the pitch oscillations and restore the aircraft to level flight but he recalls an object striking his right shin and, looking down, saw that the fire extinguisher had come out of its stowage beneath the armrest on the centre console and was hanging by its trigger from wiring behind the instrument panel in the pilot's footwell. He was also aware that his headset had been pulled from his head.

The pilot regained controlled flight at about 1,000 ft altitude with an indicated airspeed of 47 kt. He advanced the throttle slowly to increase speed and looked for fields in which to force land, finding two which were suitable. He scanned the flight and engine instruments but found nothing abnormal. Wishing to alert Air Traffic control to his situation, he located his headset, which was partially out of the fractured canopy but had been damaged. He therefore plugged in his spare headset and, whilst doing so, noticed that the powder-type fire extinguisher had partially discharged and was now lodged in the footwell behind the rudder pedals. Although the extinguisher was partially restricting pedal movement, the pilot considered that this was acceptable in the calm conditions.

In view of the fact that the aircraft appeared to be under control with all indications normal, the pilot decided that he would continue to Elstree, with all its available facilities, rather than force land in a field. He informed Farnborough North ATC of his decision, whilst climbing the aircraft and gradually increasing speed. He found that, at about 77 kt, the broken canopy pieces started to flap in the airflow and the pitch oscillations recommenced, so he continued at 70 kt and at an altitude of 1,400 ft.

He was given directions to join directly downwind for Runway 26; the wind was less than 5 kt and virtually straight down the runway. A normal approach and landing followed and the pilot was able to taxi to his normal parking spot, disembark and inspect the damage to the aircraft. He found, in addition to the broken canopy, that the tailplane was severely buckled with ruptures on both sides and with consequent damage to the elevator. It was evident that the tailplane had been very close to complete failure (Figure 1).



**Figure 1**

Right side tailplane from G-MELL, showing severe buckling damage. Left side similar.  
(Photo courtesy LAA)

## Analysis

The pilot of G-MELL could not be precise about the sequence of events; his original notification of the accident to the AAIB mentioned the possibility that the chain of events may have started with a birdstrike on the canopy. No evidence of bird remains was found and that theory has been discounted. As the origin of the canopy rupture was directly above the pilot's head, and with his recollection of finding his headset lodged in the hole, it would suggest that his head(set) had struck the canopy under significant negative 'g'. A test overseen by the (LAA) showed that there was sufficient movement, even with the seat harness fastened, to allow this to happen.

The most likely scenario, and the one being explored by the LAA, is that a sharp vertical gust of wind (perhaps the result of the aircraft's speed being abnormally high at low level) overstressed the tailplane and the 'g' spike caused the unsecured fire extinguisher to rise out of its stowage and the pilot's head to strike the canopy.

## Safety action taken

On 12 June 2014, the LAA issued Airworthiness Information Leaflet LAA MOD/338/018 Issue 1 to all existing and potential owners of homebuilt Sportcruisers. This reduced the  $V_{NE}$  of the aircraft from 138 kt to 120 kt. They followed it up on 13 June with Airworthiness Alert LAA/AWA/14/09 which gave a brief summary of the incident, highlighting the potential dangers posed by the unsecured fire extinguisher.

The LAA also published an article in the July 2014 edition of their journal *Light Aviation*. This gave a verbatim account of the pilot's experiences, illustrated with photographs of the damage.

The LAA has initiated a design and certification review of the Sportcruiser tailplane structure with a view to eventually relaxing the  $V_{NE}$  restriction, which is seen as a temporary mitigation measure.