No: 1/92 **Ref: EW/G91/10/03** **Category: 1b**

Aircraft Type and Registration:	Cessna 421C Golden Eagle, G-TELL	
No & Type of Engines:	2 Continental GTSIO-520-L piston engines	
Year of Manufacture:	1980	
Date & Time (UTC):	4 October 1991 at 1030 hrs	
Location:	Southampton (Eastleigh) Airport, Hampshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 4
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damaged aileron trim tab	
Commander's Licence:	Private Pilot's Licence with Instrument rating	
Commander's Age:	58 years	
Commander's Flying Experience:	2,780 hours (of which 310 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB examination of failed component	

During approach to Southampton airport, the pilot became aware that the aircraft was out of balance laterally, and right rudder and aileron were required to retain a level attitude. Information from the passengers indicated that the flaps on the left hand side may have suffered damage, and so the pilot elected to carry out a flapless landing. This was accomplished without incident.

Subsequent inspection revealed that the trim tab on the left aileron had become disbonded. The tab is of lightweight construction, consisting of two end ribs joined to a spanwise spar that incorporates the 'piano' hinge A single piece of alloy skin, folded at the trailing edge, is bonded to the ribs and spar. It was apparent that there had been a complete bond failure, as can be seen in the accompanying photograph. The tab skin was prevented from becoming detached from the aircraft only by the operating arm attachment bracket which was rivetted to the underside of the tab. The tab was examined by the Materials and Structures Department of the Royal Aerospace Establishment, and the aircraft manufacturer assisted by providing constructional details. It was noted that:-

The adhesive, which was in a soft and rubbery state, was not of the specified type.

Although there was a yellow tint consistent with bond primer having been applied to the spar and ribs, no such treatment was evident on the skin.

There were large areas of voids in the adhesive, which would have weakened the joint and rendered it more susceptible to degradation by moisture.

Adhesive could be peeled off the skin very easily, indicating a very weak bond. By contrast, the adhesive could not be peeled from the spar assembly.

The skin did not have the visual appearance of having been etched; however, it would have been necessary to carry out additional work involving etching samples of the alloy actually used, in order to confirm this.

No part numbers or inspection stamps were visible anywhere on the assembly.

The trim tab's source of manufacture could not thus be identified. The aircraft manufacturer has requested that the component be returned to them for additional investigation. A UK Cessna dealer has ventured the opinion that a replacement skin had been bonded to the original spar/end rib assembly.

Aileron trim tab on G-TELL showing disbonding between skin, ribs and spar