No: 5/87 **Ref: 1c**

Aircraft type and registration:	Cessna 152 G-BHMF Slingsby T67A G-BIUZ
No & Type of engines:	Cessna: One Lycoming 0-235 L2C piston engine Slingsby: One Lycoming 0-235 N2A piston engine
Year of Manufacture:	Cessna: 1980 Slingsby: 1984
Date and time (UTC):	25 February 1987 at 1616 hrs
Location:	Cranfield Aerodrome, Bedfordshire
Type of flight:	Training, both aircraft
Persons on board:	Crew — Cessna 1 Passengers — Nil Slingsby 1 Nil
Injuries:	Crew — Cessna, None Passengers — N/A Slingsby, Serious burn injuries N/A
Nature of damage:	Cessna: Serious damage to propeller, cowling and wings Slingsby: Aircraft destroyed
Commander's Licence:	Cessna: Student Pilot Slingsby: Private Pilot's Licence
Commander's Age:	Cessna: 21 years Slingsby: 31 years
Commander's Total Flying Experience:	Cessna: 17 hours (all of which were on type) Slingsby: 225 hours (of which 153 were on type)
Information Source:	AIB Field Investigation.

History of the Flight

The pilot of a Slingsby T67 was rejoining the circuit following a general handling sortie to the west of Cranfield and had requested a straight in approach to Runway 08 via a locally agreed reporting point 6 km to the West of the 08 threshold, (see diagram). In response to this request, he was advised that he was No 1 in the traffic pattern and was instructed to continue his approach but the air traffic controller (ATCO) could only give a 'continue' clearance because there was an aircraft flying an instrument approach to Runway 22 at 3 miles for a go-around.

Shortly after the T67 was given this clearance to continue the pilot of a Cessna 152, who was in the circuit on only her second solo flight, reported 'downwind' and was advised that she was No 2 to an aircraft making a straight-in approach. She acknowledged receipt of this ATC message and continued her circuit, turning onto base leg, reducing speed to 65 knots (kt) and selecting approach flap. Meanwhile, the T67 continued its approach at a speed of 60 kt. When just over one minute from touchdown the T67 called 'finals touch and go' and was cleared to

land initially but told to expect rolling clearance when on the runway.

A reconstruction of the aircrafts' flight paths indicated that at this time the 152 had just started its finals turn and was quite close to the T67. Thirty seconds after the T67's 'finals' call, the pilot of the 152 reported finals and was also given clearance to continue the approach. At this point witnesses on the ground saw the aircraft in close proximity to each other with the 152 above and behind the T67. The 152 was observed to be on a steeper and faster approach than the T67. As the T67 neared the runway threshold, the ATCO was satisfied that there was no longer a conflict between the traffic landing on runway 08 and the instrument traffic on runway 22. Having scanned the approach to runway 08, which was directly into sun, he gave the T67 clearance to 'touch and go'. Almost immediately he became aware of the 152 making a steep approach close to the T67, assessed that there was a danger of collision and immediately instructed the 152 to 'go-around, go-around, acknowledge'. The pilot of the 152 received this instruction but later stated that before she could initiate a go-around she became aware of another aircraft below her and a collision occurred.

The meteorological observation taken at the time of the accident indicated a surface wind of 080° at 10—15 kt, no significant cloud and a visibility of 4000 metres in haze. Expert witnesses who were airborne at the time of the accident reported the in-flight visibility as 3000 to 4000 metres generally but less than 3000 metres into sun. The flying club rules relating to the 152 stated that a minimum visibility of 6000 metres was required for solo flight.

Analysis of the air traffic control tape indicated that the aircraft collided three seconds after the start of the last ATC transmission.

Examination of the Wreckage

Ground impact marks and wreckage distribution revealed that the two aircraft had made initial contact at about 10 feet over the 08 runway designation numbers. The 152, which had been descending relative to the T67 and overtaking it at approximately 10 kt, struck and crushed the rudder of the T67 with its right wing, flattening and tearing its own leading edge back to the front spar. This contact caused the T67 to pitch up and the 152 to yaw right, permitting the propeller of the 152 to slice into the upper left side of the T67 fuselage just aft of the cockpit and precipitating a failure of its fin to the right. The spinner of the 152 had contacted the rear of the T67 canopy frame, causing it to distort and shatter the canopy. Both aircraft were still airborne at this time.

The aircraft then separated with the 152 yawing through approximately 180° to the right and striking the ground, whilst doing so, with its left wing tip and tail before coming to rest on its wheels on a heading of 275° magnetic. There was no fuel spillage or fire associated with this aircraft and the pilot was able to make her escape unaided.

After this main impact the T67 continued to pitch up, effectively performing a stall turn to the right, before striking the runway in a steep nose down attitude of some 70°, on an approximate heading of 190° magnetic. In doing so the propeller broke free from its mounting flange, the engine bearers failed, leaving the engine connected only by several control cables, and the nose gear detached. At this point a flash fire occurred, leaving a discrete burnt patch on the runway. The aircraft continued, travelling backwards, for a further 25 feet before coming to rest on a heading of 238° magnetic. A severe fuel fed fire then became established which mostly affected the cockpit and right wing. The pilot made his escape through the broken canopy, albeit with his clothes on fire, before collapsing at the side of the runway. Within a very short period of time nearby witnesses and the airfield rescue services arrived.

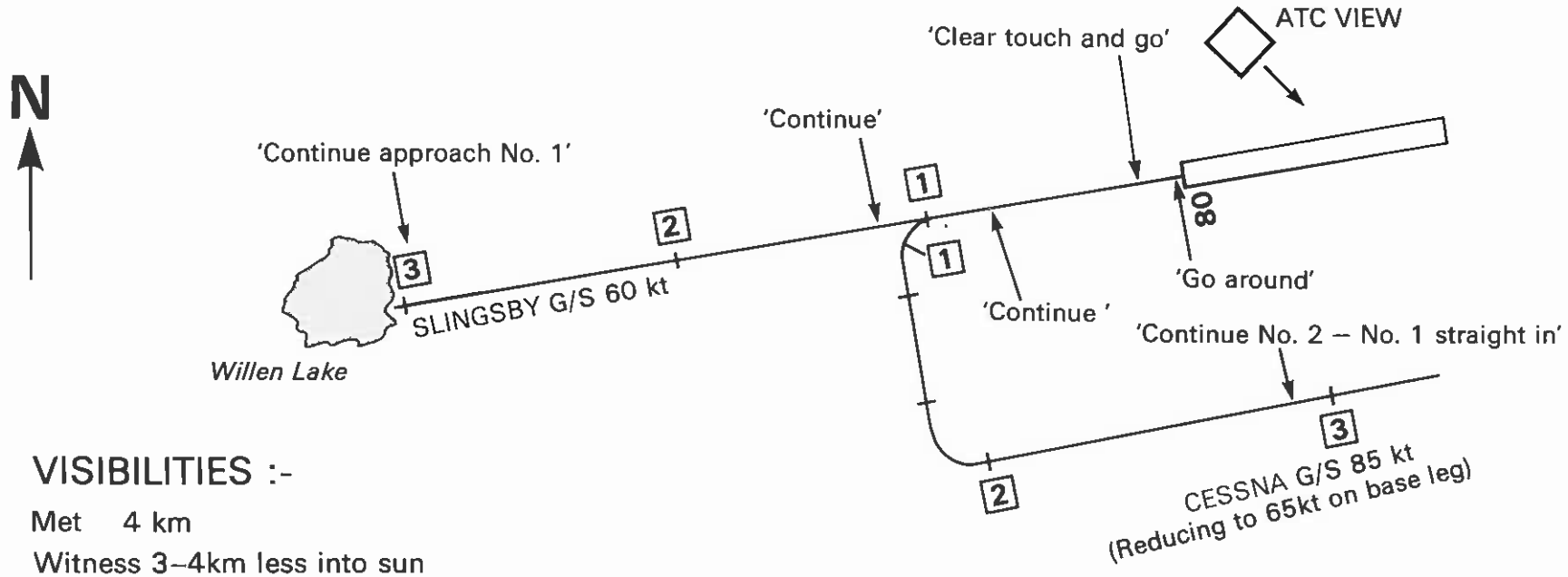
A detailed examination of both aircraft did not reveal any pre-impact defects in the flying control systems or airframes which could have contributed to the accident, and both propellers exhibited evidence of the engines producing some power at impact. However, a leak was detected in the pitot head of the 152, which could not be attributed to the accident. This precluded an accuracy check of the system.

It was established, on examination, that the 152 was configured with 20° of flap, the throttle was fully open, carburettor heat was selected to hot air and the mixture was fully rich. The radio was set to the correct frequency and a post accident functional check, from the accident site, using the headset installed in the aircraft showed it to operate satisfactorily. It was also established that only the tail mounted beacon had been selected ON, but serviceable taxi, landing and navigation lights were available for use. The tail beacon light bulb filament had suffered a 'hot' failure, but it could not be determined if this had occurred at or before the collision.

Likewise, it was established that the T67 was configured with full flap, the throttle control in the cockpit was fully open, carburettor heat was selected to hot air and the mixture was fully rich. Due to the engine detachment, however, these engine control settings cannot be considered reliable. The radio installation had been badly burnt and yielded no useful information but it was established that the aircraft's taxy and navigation lights were selected at ON at the time of the collision. Neither light system, however, could be checked for serviceability.

Both aircraft altimeters displayed the correct QFE setting of 1000 mb and the documentation of both aircraft was in order.

ACCIDENT TO CESSNA 152 AND SLINGSBY T67 AT CRANFIELD ON 25th FEBRUARY 1987



VISIBILITIES :-

Met 4 km

Witness 3–4km less into sun

Club rules for solo flight 6 km

WIND
090°/10–15kt

SUN

☐ Time (minutes) from collision

Scale: 1cm = 500 metres (approx)