No: 5/89 **Ref: EW/C1096** **Category: 1c**

Aircraft Type and Registration:	(1) Cessna 182R G-BLFV (2) Cessna F152 G-WACD
No & Type of Engines:	(1) 1 Continental Motors Corp O-470-U piston engine (2) 1 Lycoming O-235-N2C piston engine
Year of Manufacture:	(1) 1982 (2) 1986
Date and Time (UTC):	22 January 1989 at 1555 hours
Location:	Wycombe Air Park, Marlow, Bucks
Type of Flight:	(1) Pleasure (2) Training
Persons on Board:	Crew - (1) 2 Passengers - None (2) 2 Passengers - None
Injuries:	Crew - (1) 2 (Serious) (2) 2 (Serious)
Nature of Damage:	Both aircraft destroyed
Commander's Licence:	(1) Private Pilot's Licence (2) Private Pilot's Licence with Full Instructor rating
Commander's Age:	(1) 43 years (2) 57 years
Commander's Total Flying Experience:	(1) 75 hours of which 10 hours were on type (2) 8,500 hours of which 110 hours were on type
Information Source:	AAIB Field Investigation

History of the flights

The Cessna 152 G-WACD (CD) was engaged on an instructional flight with an experienced instructor and a low time student, and commenced the detail at 1500 hrs. Runway 25 was in use at Wycombe and intensive gliding activity was being carried out in the area to the south of the runway. After completion of an upper air exercise to the north, the aircraft returned to Wycombe and rejoined the right hand circuit on base leg. Due to a conflicting Piper aircraft, CD carried out a go-around into a standard circuit. The instructor has stated that it is his practice to call "downwind roller" (touch and go landing) where appropriate, and he believes he made that call on this occasion. After the aircraft landed the instructor raised the flaps and set the carburettor heat to cold, and the aircraft was accelerated and took off climbing at what was described as a fairly steep angle. The occupants heard a loud bang and lost control of the aircraft which pitched nose down and rolled to the left impacting in

the grass area south of the runway in a left wing low, nose down attitude before coming to rest mainly inverted.

The other aircraft involved in the collision was a Cessna 182 G-BLFV (FV) which had departed from Wycombe at 1230 hrs for Cardiff with two pilots on board, one authorised as PIC for the outbound flight, and the other authorised as PIC for the return flight. Upon its return from Cardiff the aircraft had rejoined downwind for runway 25 and the pilot has stated that he widened his circuit because he was aware that he was catching up with the aircraft in front. On finals it was apparent that his aircraft was still catching up with the preceding aircraft which was a third to halfway down the runway. The pilot of FV recalls that he initiated a go-around when he was approximately over the threshold of runway 25 by applying full power. He believes that he selected the carburettor heat to cold, left the flaps at their selected position of 30° and turned only slightly to the right because the aircraft was close to the ground. After he had opened the throttle, the pilot saw a wing coming up towards him on the left side of the aircraft, felt an impact and remembers the aircraft rolling to the left but nothing more.

Witness statements indicate that they heard power being applied to FV but that the aircraft then flew level or adopted only a slow climb. The statements indicate that CD was climbing after a touch and go, ahead of FV which was flying relatively level at a height of between 50 and 100 feet. The aircraft collided at the far end of runway 25, rolled left together, descending steeply nose down before separating and crashing on the grass. The wreckage came to rest approximately 25 metres south of the runway.

The AFISO had advised CD that it could land on runway 25 and when FV called on finals, that there was one ahead. Another aircraft G-PMNL later reported on finals and was advised that there were two ahead. The AFISO saw FV over the airfield boundary with CD still on the runway and advised FV to "go-around I say again go-around acknowledge". She then turned her attention to the other aircraft on final approach and shortly after she heard an open transmission with a male voice saying "I can't see the other aircraft" or "where is the other aircraft ?". The AFISO looked back, saw the collision, activated the crash alarm and initiated the airfield emergency procedures.

The two vehicles of the aerodrome fire service were quickly on the scene joining other rescuers who were at the site. A small amount of foam was used to blanket a fuel leak, and the severely injured occupants of the two aircraft were removed from the aircraft under the supervision of two doctors, who had been gliding. The local fire and ambulance services attended and the casualties were removed to hospital. The runway was closed although the gliding activity continued from the grass. The occupants were wearing diagonal upper torso restraint and it was apparent that this contributed to their survival. When the third local authority ambulance arrived, it cut across the grass and the glider site and went directly to the scene of the accident without an escort. Consequently a glider tug on the approach was obliged to take avoiding action. It has subsequently been agreed that in the event of a similar occurrence on the airfield, all activity including gliding, will cease.

The azimuth of the sun from Wycombe at the time of the accident was 232°T with an elevation of 8°50'. The instructor in CD has stated that the position of the sun was not sufficient of a problem

that it was necessary to curtail the detail. The student and PIC of FV have stated that the sun was not a problem.

When runway 25 is in operation gliders, and their powered tugs, which are not necessarily operating on the aerodrome information frequency, operate from the grass to the south. A helipad is positioned on the airfield boundary to the north of runway 25, and helicopter training takes place to a height of 750 feet agl, with the fixed wing circuit height at 1,000 feet agl. Therefore in the event of a go around from runway 25 it could be unsafe to depart from the runway centreline even if the cause of the go around is conflicting traffic. There is no published procedure for a go-around on this runway, although the organisation that operated the aircraft teaches that if feasible, the aircraft should be flown to the right of the runway, sufficiently for the pilot in the left seat to see the runway.

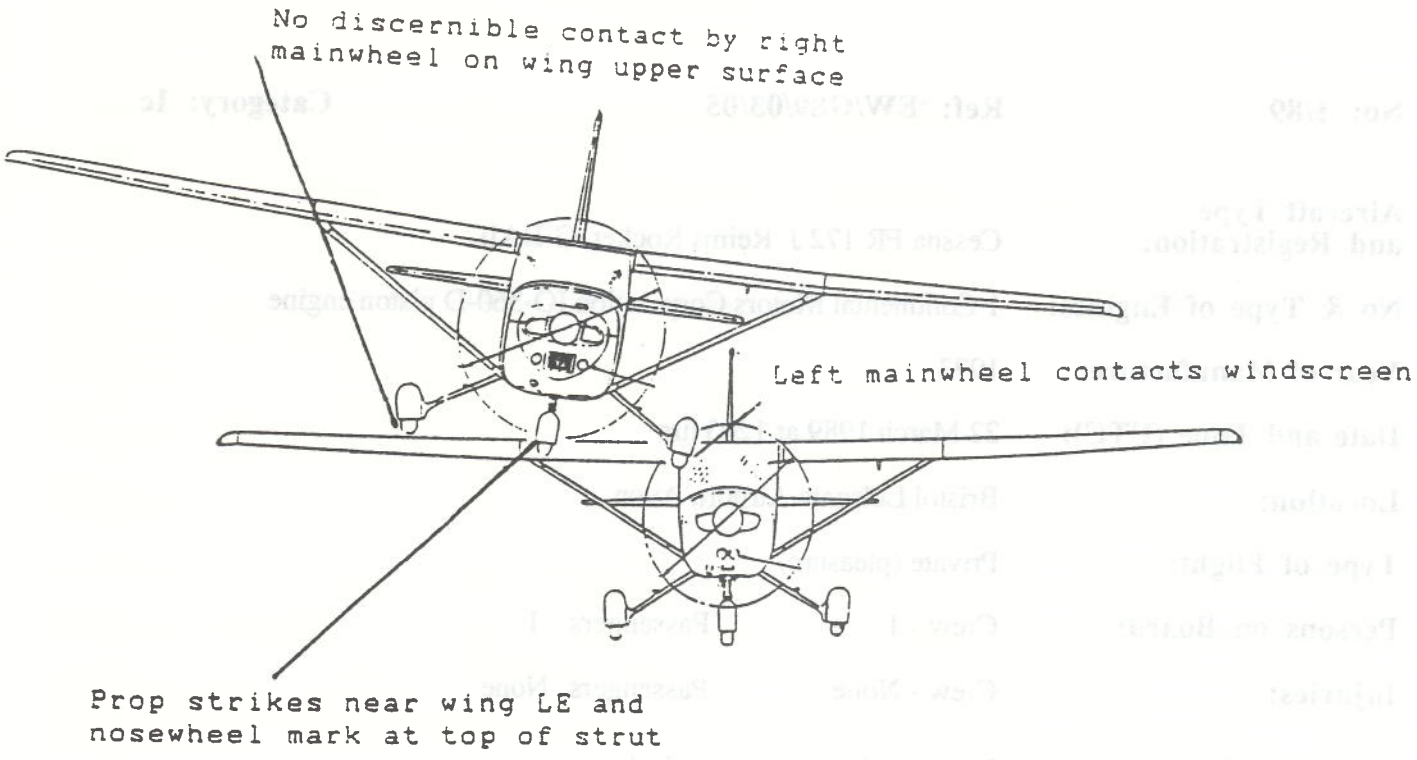
Examination of wreckage

Debris consisting mainly of windscreen fragments from CD and pieces of nosewheel spat from FV were found both on the runway surface and on the grass to the right of it, starting from a point some 120 metres from the end of runway 25. Additionally there was a Cessna 152 checklist and some small fragments of light alloy subsequently found to have been released as a result of FV's propeller striking the upper surface of CD's right wing. The first marks on the ground were made by CD's left wingtip 5 metres to the left of the runway edge, some 35 metres before the point where both aircraft had come to rest. The groundmarks indicated that CD had struck the ground in a near vertical left bank with the nose approximately 45° below the horizontal. A similar set of marks displaced to the left indicated that FV had struck the ground in a similar attitude in very close proximity to CD. Both aircraft had crashed on a track of 230°M, and both had then slid along the ground inverted. It was clear that a number of airframe contacts had occurred during this process. The 152 (CD) was the more badly damaged of the two, with the engine and cockpit having almost separated from the rear fuselage. There was no fire despite extensive fuel spillage.

The wreckage was removed to a hangar on the airfield for a more detailed examination. It was observed that the engine controls were in their fully forward positions on both aircraft, *ie* full throttle, mixture fully rich and carburettor air control set to cold. Additionally, the propeller control on the 182 (FV) was at its fully forward position, *ie* high rpm. Damage to the propellers was indicative of a high power setting at ground impact. The flaps were retracted on the 152 (CD); those on the 182 (FV) were found to be extended 10-12°. Elevator trim settings were close to the mid (neutral) position on both aircraft.

Two propeller strikes were identified on the upper surface of CD's right wing: one starting 4-4½ ft in from the tip immediately aft of the forward spar and another immediately forward of it further inboard in the area of the strut attachment to the wing. The latter strike had penetrated the upper and lower wing skins. Neither strike had penetrated the fuel tank or severed any flying control cables. A tyre mark and an indentation at the top of the wing strut were identified as having been made by FV's nosewheel, which accounted for the fragments of spat found on the runway. The only other airborne damage sustained by CD was the broken windscreen and this was attributed to a blow from the left

landing gear from FV. Some light abrasion marks were found on the leg close to the wheel, but the absence of any airborne damage to the structure around the windscreen suggested a relatively light contact. Thus the probable sequence of events was that CD climbed into FV, being struck sequentially by FV's left mainwheel, nosewheel and propeller. A representation of the aircraft as they must have appeared at some point during the collision is shown in the attached figure. The absence of any evidence of contact between FV's right mainwheel and CD's right wing is why a relative roll angle is shown between the two aircraft.


No discernible contact by right mainwheel on wing upper surface
Left mainwheel contacts windscreen
Prop strikes near wing LE and nosewheel mark at top of strut