Aviation Safety Investigation Report 198900238

Cessna 152
Cessna 152

29 May 1989

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Occurrence Number: 198900238 **Occurrence Type:** Accident
Location: Jandakot Airport WA
Date: 29 May 1989 **Time:** 1408
Highest Injury Level: Nil
Injuries:

	Fatal	Serious	Minor	None
Crew	0	0	2	2
Ground	0	0	0	-
Passenger	0	0	0	0
Total	**0**	**0**	**0**	**2**

Aircraft Details:	Cessna 152	Cessna 152
Registration:	VH-BFT	VH-TNO
Serial Number:	A1520898	A1520864
Operation Type:	Aerial Work	Aerial Work
Damage Level:	Substantial	Substantial
Departure Point:	Jandakot WA	Jandakot WA
Departure Time:	N/A	
Destination:	Jandakot WA	

Approved for Release: 22nd November 1990

Circumstances:

The pilot of VH-BFT, who had limited experience in General Aviation Airport Procedures (GAAP), had completed a successful period, of dual instruction, immediately prior to the accident flight and was on a solo circuit when the accident occurred. The pilot of VH-TNO was completing the first circuit following a solo period in the training area. As VH-TNO rejoined the circuit via the crosswind leg, a route which placed VH-TNO in front of VH-BFT on downwind, VH-BFT was turning downwind from its first take off. The pilot of VH-BFT gave a downwind call, in the early downwind position, and was told by the Aerodrome Controller to follow the Cessna entering mid downwind in the 10 o'clock position (VH-TNO). VH-BFT's pilot acknowledged the instruction. The pilot of VH-TNO then gave a mid to late downwind call and was told to follow the twin (VH-DEP a Piper Navajo) on late downwind. The sequence VH-DEP, on late downwind, VH-TNO, mid to late downwind, and VH-BFT, early to mid downwind was then established. The pilot of VH-BFT did not sight VH-TNO at any stage, on downwind, and instead identified the twin on late downwind as the aircraft to follow. The pilot of VH-TNO sighted and followed the twin, as instructed. VH-TNO's pilot also sighted VH-BFT behind and to the right and assessed that VH-BFT was clear of VH-TNO. The two aircraft proceeded to carry out normal circuits. During their independent turns onto final approach, for runway 06, VH-BFT, which turned base leg inside VH-TNO, descended onto VH-TNO from above, behind and slightly to VH-TNO's left. VH-BFT's right wing tip leading edge contacted the top of VH-TNO's vertical stabilizer bending the top one third of the rudder, causing it to jam, and denting and dislodging the fairing at the top of the tail fin. The relative positions of the two aircraft during the base leg and turn onto final approach prevented either pilot from seeing the other aircraft until after the collision. Following the collision the pilot of VH-TNO realised that something had happened, that the aircraft rudder was jammed and that an immediate landing was necessary. The pilot of VH-TNO continued straight ahead and landed on runway 06. The aircraft ran off the runway onto the grass. The pilot of VH-BFT sighted VH-TNO shortly after the collision, diverted to the left and below VH-

TNO and initiated a go-around. VH-BFT eventually landed safely. Three controllers were on duty in the Jandakot control tower at the time of the accident. One controller occupied the Aerodrome Controllers (ADC) position and a second controller the combined position of Surface Movement Controller (SMC) and Coordinator (Coord). A third controller, occupying the Senior Tower Controller's position (Snr Twr), had completed a handover/takeover after coming on duty and was occupied at the rear of the tower. Circuit traffic at the time of the accident was moderate although traffic during the period immediately before the collision was heavy. In the hour before the collision, 98 movements were recorded with a further 66 during the hour of the accident. In the 12 minutes prior to the accident a disproportionate number of 44 movements were recorded. There were seven other aircraft in the circuit when VH-TNO joined downwind, with six remaining at the time of the collision. Radio traffic was also very heavy during the period immediately prior to the collision. The ADC made and received 125 two way radio transmissions during the 12 minutes preceding the accident. Having allocated a downwind sequence to the two aircraft, and believing that VH-BFT's pilot's acknowledgement of sequencing instructions meant that VH-TNO had been sighted, the ADC's attention was concentrated on the other circuit traffic. During the 2 minutes 40 seconds between the ADC's last downwind call to VH-TNO and the collision there were 14 two-way transmissions. The workload and practices were such that the ADC did not observe either VH-TNO or VH-BFT again until immediately prior to the collision. The ADC had checked the runway was clear of traffic, was moving VH-TNO's flight strip and was giving its pilot a clearance to land when the impending collision was first noticed. As both aircraft were head on to the tower and the aircraft were approximately the same distance from the threshold it was not possible for the ADC to determine which call-sign belonged to which aircraft. The ADC was unable to give any collision avoidance instructions as they could have made the situation worse. Responsibility for separation in the circuit area at Jandakot rests with the Pilot's in Command of circuit aircraft. Assistance is provided by the air traffic controllers by issuing instructions for rejoining, downwind sequencing and landing clearances. Safe separation in the circuit depends on a good lookout and on the pilot understanding controller's instructions, following those instructions and advising the controller if the instructions have not been understood or can not be complied with. In this accident the pilot of VH-BFT and the ADC, thought that the downwind sequence instruction had been understood and was being followed. The pilot's inexperience led to the misidentification of conflicting traffic, whilst a combination of workload and aircraft positions probably led to a less than adequate lookout and a failure to sight the real conflicting traffic. Although there were three controllers in the tower, circumstances, workload and the belief that the pilot of VH-BFT had sighted the conflicting traffic, prevented the developing collision from being observed, by the Tower Controllers, until it was too late.

Significant Factors:

The following factors were considered relevant to the development of the accident

1. Pilot Inexperience The pilot of VH-BFT was inexperienced in aviation and particularly in GAAP. Although instructed to follow the Cessna entering mid downwind, in front, at the 10 o'clock position the pilot identified a different aircraft, a twin of different make, in the 12 0'clock position which was on late downwind. A more experienced pilot would be expected to look for the aircraft at 10 o'clock, to know the difference between that aircraft and another on late downwind and, if it was not identified, indicate that fact to the Tower by radio. The pilot had completed a dual trip immediately prior to the accident flight and although difficulties were initially encountered with Jandakot circuit procedures the instructor's final assessment was that the pilot's procedures were satisfactory.

2. Distraction by Other Procedures and/or Cockpit Visibility Problems. An experienced pilot would be expected to sight another aircraft in front and to the left at the same height on downwind. Although the reason why the pilot of VH-BFT did not sight VH-TNO during the downwind leg could not be determined , there were three main possibilities; (a) The pilot was concentrating on the downwind spacing from the runway, and manipulation of the aircraft controls and/or downwind checks caused a distraction which prevented a good lookout. (b) The position of VH-TNO in relation to VH-BFT was such that the lefthand windscreen pillar prevented the pilot of VH-BFT from sighting VH-TNO. (c) A combination of both the above.

3. Task Saturation The radio transmission traffic during the period preceding the collision was very heavy. An experienced pilot would be expected to listen to the radio transmissions to help determine the position of the traffic in the circuit. The pilot of VH-BFT had the opportunity to recognise a mistake when the pilot of VH-TNO was given downwind sequencing. Inexperienced pilots, attempting to cope with the other tasks associated with circuit flying may mentally tune out the radio traffic that does not refer to their aircraft.

4. Failure of the Safety Net The safety net, an overall safety concept, which is provided by the Tower Controllers, is dependent on the controllers having the time to carry out their sequencing, landing clearance and other tasks as well as being able to inspect the circuit for possible developing unsafe situations. The ADC, having given the pilot of VH-BFT sequence instructions and believing that they were understood and followed, was then engaged on other tasks and did not check the late downwind to final legs of the circuit again until immediately prior to the collision. The SMC/Coord and Snr Twr controllers were engaged in their own tasks and did not observe the developing confliction. Consequently the safety net did not work.

5. Aircraft Idenification Problems (a) The position of the aircraft, in relation to the ADC prevented the ADC from being able to differentiate between the conflicting aircraft and issue collision avoidance instructions. (b) The use of the words Cessna and twin may not have provided sufficient identification information. A Cessna can also be a twin

Reccomendations:

1. All pilot's and operators, at GAAP aerodromes, should be reminded, through the publication of this incident in either the BASI Journal or the Civil Aviation Authority (CAA) Safety Digest, of their obligations to ensure that they and/or their pilots and students understand and comply with circuit radio and operational procedures. In particular student pilots should not be permitted to operate solo in a GAAP circuit unless they are fully conversant with all the required procedures.

2. The Civil Aviation Authority should carry out a review of the operational and administrative procedures used in the Control Towers at GAAP airports with a view to improving the safety net provided by the Tower Controllers. In particular the CAA should consider the allocation of a specific task, traffic spotting, to one of the Tower Controllers. At airports where there are high traffic densities and/or there is a significant pilot training component this task may need to be allocated to an additional tower position. Subsequent to the accident a parallel runway has been built at Jandakot to relieve traffic congestion. Tower staffing and procedures have been changed to provide better ATS coverage both for the new parallel runway system and in general.