

FINAL REPORT

**GROUND COLLISION BETWEEN
A PIPER PA28 AIRCRAFT, REGISTRATION 9V-BOE
AND A VAN
IN SELETAR AIRPORT, SINGAPORE
ON 23 MARCH 2006**

AIB/AAI/CAS.032

**Air Accident Investigation Bureau of Singapore
Ministry of Transport
Singapore**

4 July 2006

The Air Accident Investigation Bureau of Singapore

The Air Accident Investigation Bureau (AAIB) is the air accidents and incidents investigation authority in Singapore responsible to the Ministry of Transport. Its mission is to promote aviation safety through the conduct of independent and objective investigations into air accidents and incidents consistent with Annex 13 to the Convention on International Civil Aviation.

The AAIB conducts the investigations in accordance with the Singapore Air Navigation (Investigation of Accidents and Incidents) Order 2003 and Annex 13 to the Convention on International Civil Aviation, which governs how member States of the International Civil Aviation Organisation (ICAO) conduct aircraft accident and incident investigations internationally.

The investigation process involves the gathering, recording and analysis of all available information on the accidents and incidents; determination of the causes and/or contributing factors; identification of safety issues; issuance of safety recommendations to address these safety issues; and completion of the investigation report.

In carrying out the investigations, the AAIB will adhere to ICAO's stated objective, which is as follows:

"The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability."

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AIRCRAFT DETAILS

PIPER WARRIOR PA28-161

Classification	: Incident
Aircraft Type	: Piper Warrior PA28-161
Registration	: 9V-BOE
Number and Type of Engines	: 1 x Lycoming 0-320-D3G Piston Engine
Weight and Dimensions	: 1,391 pounds (633 kg), Wingspan 35 ft.
Place	: Seletar Airport, Singapore
Date & Time (Local Time)	: 23 March 2006 at 1023 hrs
Type of Flight	: Training flight (first solo)
Persons on Board	: 1
Point of Departure	: Seletar Airport, Singapore
Destination	: Seletar Airport, Singapore

SYNOPSIS

After a successful first solo flight at Seletar Airport, a student pilot from a flying club in Seletar Airport was cleared to taxi to Parking Bay A4 where his instructor was to meet him. While taxiing on the apron area, the student made a premature turn into Parking Bay C14 where a Learjet aircraft was parked.

The student pilot tried to get his aircraft out of the area by taxiing between the Learjet and a parked airport van that was waiting to cross the runway. He managed to steer the aircraft clear of the Learjet but the aircraft's left wing tip struck the rear of the van and the left wing's leading edge subsequently hit the right side of the van.

Neither the student pilot nor the van's driver was injured in this incident.

The aircraft suffered damage to its left wing tip, left navigation lights and the leading edge of the left wing. The rear screen of the van was shattered and the right side of the van was dented and gouged.

1 **FACTUAL INFORMATION**

All times used in this report are Singapore times. Singapore time is eight hours ahead of Coordinated Universal Time (UTC).

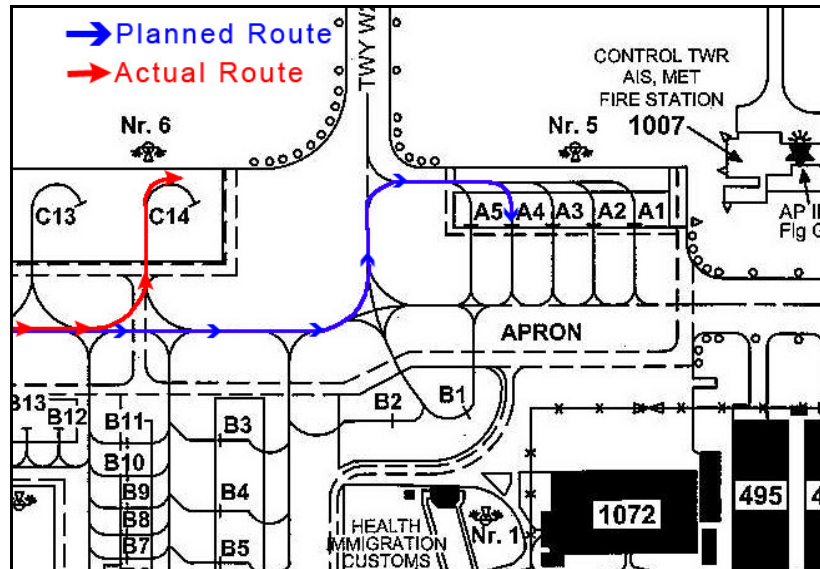
1.1 **History of the flight**

- 1.1.1 A student pilot from a flying club in Seletar Airport was to perform his first solo flight on a Piper PA28 aircraft on the day of the incident. He first flew a 50-minute pre-solo check sortie with his instructor. On completion of this check sortie, he landed on Runway 03, turned off the runway at Taxiway W2¹ and taxied to Parking Bay A4.
- 1.1.2 The instructor was satisfied with the check sortie. He briefed the student pilot on the requirements of the solo flight and pointed out the expected taxi route after his landing (via Taxiway W2) to go to Parking Bays A1 to A5, any of which may be assigned by the ground controller.
- 1.1.3 At Parking Bay A4, the instructor left the student pilot and went up the control tower to monitor the solo flight. The student pilot proceeded with the solo flight by taxiing to the threshold of Runway 03 via Taxiway W3¹ for the take-off.
- 1.1.4 The solo flight and the subsequent landing on Runway 03 were uneventful. During the landing roll, the tower controller instructed the student pilot to turn off at Taxiway W1¹ at the far end of the runway, as Taxiway W2 was occupied by a helicopter. The student pilot was asked by the control tower to 'expedite a little bit' in vacating the runway as another aircraft was approaching to land.
- 1.1.5 The student pilot had previously taxied from the runway via Taxiway W1 back to the flying club's dispersal area and on the way, he was shown how to taxi to Parking Bay Alpha (A1-A5) by his instructor. This was carried out on 9 March 2006, i.e. 13 days before the incident, fulfilling a pre-solo requirement set by the flying club for students to taxi through this route at least once during their circuit training phase, supervised by their instructor.
- 1.1.6 Upon leaving the runway at Taxiway W1, the student pilot completed his after-landing checks and was cleared by ground control to taxi to Bay A4. The instructor left the tower at this time to meet the student pilot at the Bay.

¹ There are three taxiways linking the runway to the western apron area. Taxiway W1 is at the northern end of the runway, W2 close to the middle and W3 about 580 metres from the southern end.

- 1.1.7 After turning off from Taxiway W1 and into the main taxiway in the apron area, the student pilot's intention was to taxi to Taxiway W2 and then to Bay A4. The student pilot stated in his subsequent interview with the investigation team that, while proceeding southwards on the main taxiway in the apron area, he became disoriented and mistook the taxiway line leading to Bay C14 as the line leading to Taxiway W2 and turned left prematurely into Bay C14. Figure 1 shows the path that the student pilot intended to take and the path actually taken.

Figure 1. Taxi path taken by the student pilot



- 1.1.8 The student realised his mistake when he saw that the taxiway line led to a parked Learjet. He then decided to go to the end of Bay C14 and go around the Learjet to get back to the main taxiway in the apron area. He assessed that his aircraft could pass safely between the Learjet on his right and an airport van on his front left. The driver had parked the van at the edge of the apron while waiting for clearance to cross the runway via Taxiway W2. The student felt that there was no need to inform the ground controller of his situation or to stop the aircraft as he judged that his aircraft could regain the correct taxi route without difficulty.
- 1.1.9 The student pilot assessed that he would comfortably avoid collision with the van while taxiing behind the Learjet. He focused his attention solely to his right side to keep clear of the Learjet and did not look at his left side. Just when he had cleared the Learjet, he heard a loud 'bang' and felt the aircraft swerve to the left. He immediately applied brakes and stopped the aircraft. The van's driver had seen the approaching aircraft in his rear-view mirror, and attempted to move the van out of the way, but he had insufficient time to do so. The collision occurred at about 1023 hrs. Figure 2 shows the aircraft and the van after the collision.

Figure 2. Position of the aircraft and the van after the collision



- 1.1.10 The aircraft's engine was left running and the student pilot heard a call from the ground controller, who had seen the incident from his position at the tower, to hold his position. When the flying instructor came out of the tower, he saw the aircraft at Bay C14. It appeared to him that the aircraft had collided with a van. He ran about 300 metres to the aircraft and helped the student pilot shut down the engine before the latter evacuated the aircraft.
- 1.1.11 Using his handphone, the instructor informed the Watch Manager at the tower of the situation. The Watch Manager then activated the Airport Emergency Service at 1026 hrs. The first emergency response vehicle arrived at the scene at 1028 hrs, within two minutes after the activation.
- 1.2 **Injuries to persons**
- Nil.
- 1.3 **Damage to aircraft**
- 1.3.1 The port wing tip and the associated navigation lights were damaged. The leading edge of the port wing suffered skin damage. The aircraft did not sustain any structural damage. See Figure 3.

Figure 3. Damage to the aircraft



1.4 Other damage

- 1.4.1 The rear glass screen of the van was shattered. The right side passenger window frame and the right front panel of the van were damaged.

1.5 Personnel information

1.5.1 Pilot-in-command

Age	: 17 years (Male)
Licence	: Student Pilot's Licence issued by the Civil Aviation Authority of Singapore.
Licence expiry date	: 30 April 2007
Total flying experience	: 18.2 hrs
Flying experience on type	: 18.2 hrs
Last medical check	: 7 May 2005
Medical certificate expiry	: 31 May 2006

1.5.2 Instructor

Age	: 51 years (Male)
Licence	: Commercial Pilot's Licence issued by the Civil Aviation Authority of Singapore
Licence expiry date	: 31 July 2006
Total flying experience	: 10,628.3 hours
Flying experience on type	: 461.8 hours

1.6 **Aircraft information**

- 1.6.1 The aircraft was serviceable and had a valid Certificate of Airworthiness.
- 1.6.2 The weight and balance of the aircraft was within the limits set out in the aircraft flight manual.
- 1.6.3 The aircraft's performance is such that, when landing from either Runway 03 or 21, the aircraft can be slowed down sufficiently to use Taxiway W2 to turn off the runway.

1.7 **Meteorological information**

- 1.7.1 At the time of the incident, the weather condition was clear. Visibility was good. The weather was reported as follows:

Runway surface wet
Wind 030 degrees 5 knots
QNH 1008 mb
Visual Meteorological Conditions (VMC)
NOSIG (no significant weather)

1.7 **Aids to navigation**

- 1.8.1 Taxiway markings and signs at Seletar Airport were in good condition and meets ICAO Standards and Recommend Practices (SARP) of ICAO Annex 14. The aerodrome and its facilities were not a factor in this incident.

1.9 **Flight recorders**

- 1.9.1 Not applicable.

1.10 **Communications**

- 1.10.1 ATC communications between the aircraft and Seletar Tower were normal.

1.11 **Aerodrome information**

- 1.11.1 Seletar Airport has a single 1592 m x 46 m runway, designated Runway 03/21. The main apron is on the west side of the runway, with a much smaller apron on the east side.

1.12 **Wreckage and impact information**

- 1.12.1 Not applicable.

1.13 **Medical and pathological information**

1.13.1 The student pilot was sent for medical examination immediately after the incident. Nothing abnormal was found.

1.14 **Fire**

1.14.1 There was no fire.

1.15 **Survival aspects**

1.15.1 This incident was survivable.

1.16 **Tests and research**

1.16.1 The aircraft's brake system was tested after the incident and was found to operate normally.

1.17 **Organisational and management information**

1.17.1 The Operations Manual of the flying club to which the student pilot belonged requires the instructor sending a student on the first solo flight to be at the control tower to monitor the flight. The Manual did not specify that the instructor must monitor the ground manoeuvres of his solo student.

1.18 **Useful or effective investigation techniques**

1.18.1 Not applicable.

2 ANALYSIS

The analysis covers the following areas:

- Student pilot's action
- Van driver's action
- Flying club's standard operating procedures

2.1 Student pilot's action

2.1.1 The student pilot made a premature turn from the main apron taxiway into Bay C14 but realised his mistake. He faced an unusual situation of having to taxi between the Learjet parked at Bay C14 and the van parked at the edge of the apron. He did not consider stopping the aircraft and asking for assistance from air traffic control or his instructor, probably thinking that it was a minor deviation that he could correct without drawing attention. He tried to exit the parking bay by taxiing between the Learjet and the van and while doing so, gave his full attention to avoidance of the Learjet. He did not look at his left side and the collision with the van caught him completely by surprise.

2.2 Van driver's action

2.2.1 The van was parked at the edge of the apron and was waiting for clearance from the tower to cross the runway via W2. The van was not in violation of apron movement procedures.

2.2.2 At the position where he was waiting, the van driver did not expect a taxiing aircraft to approach from the rear. When he saw the aircraft appear behind his van, there was insufficient time for him to move the van and avoid the collision.

2.3 Flying club's standard operating procedures

2.3.1 The flying club's Operations Manual specifies that the instructor sending a student on his first solo flight should remain in the tower to monitor the flight. Some of the instructors would monitor their students' ground manoeuvres from the tower till the aircraft turned into Bays Alpha while others would leave the tower when the aircraft had landed safely and vacated the runway. This incident may have been avoided if the instructor had remained in the tower to monitor his student, till the aircraft stopped at Bay A4.

3 **CONCLUSION**

3.1 **Findings**

- 3.1.1 The student pilot was ready for his first solo sortie.
- 3.1.2 While taxiing the aircraft after the flight, he became disoriented and followed a wrong taxiway line into an unfamiliar area.
- 3.1.3 The van was parked at the edge of the apron and was not in violation of apron movement procedures.
- 3.1.4 The student pilot concentrated on maintaining his clearance from the parked Learjet, after initially assessing that he had sufficient room to be clear of the van. His full attention was devoted to the right side of his aircraft where the Learjet was and he did not realise the danger on the other side. This misjudgement led to the incident.

3.2 **Significant Factors**

- 3.2.1 Just after the aircraft had turned off the runway into Taxiway W1, the instructor left the tower to go to meet the student pilot at the apron. Had he stayed on in the tower to observe his student's ground manoeuvres, he may have been able to give directions to his student when the latter made the error of turning into Bay C14.
- 3.2.2 When the student had realised his mistake of entering into the wrong parking bay, he did not stop the aircraft and ask for assistance from air traffic control or his instructor. If he had done so, he would have been assisted in taxiing out from the bay.

4 **SAFETY ACTION AND RECOMMENDATIONS**

- 4.1 A day after the incident, the flying club concerned took the safety action of issuing an instruction that its Duty Instructor shall remain in the tower to closely monitor his solo student until the latter has parked his aircraft at the end of the solo sortie.
- 4.2 The investigation team recommends that the flying club emphasise to its student pilots that they should seek instructions if they encounter difficulties during their solo sorties. [AAIB Recommendation R-2006-01]