

**Aviation Safety Investigation Report
199101024**

Piper PA32-R301

26 January 1991

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Occurrence Number: 199101024
Location: Mount Gambier SA
Date: 26 January 1991
Highest Injury Level: Fatal
Injuries:

Occurrence Type: Accident
Time: 45

	Fatal	Serious	Minor	None
Crew	1	0	0	0
Ground	0	0	0	-
Passenger	2	0	0	0
Total	3	0	0	0

Aircraft Details: Piper PA32-R301
Registration: VH-MLV
Serial Number: 32R-8113008
Operation Type: Private
Damage Level: Destroyed
Departure Point: Mount Gambier SA
Departure Time: N/A
Destination: Warrnambool VIC

Approved for Release: 23rd July 1991

Circumstances:

At 0032 hours the pilot advised Flight Service that he was taxiing at Mount Gambier and nominated runway 36 for takeoff. A report was received at 0040 hours indicating the aircraft was back-tracking on runway 36. No further reports were received from the aircraft. As a result of transmissions received from an emergency locator beacon, a ground search subsequently located the wreckage of the aircraft in a pine plantation about 480 metres north-west of the northern end of runway 36. Conditions were moonless and very dark, with no fixed ground lighting for 13 kilometres to the north of the aerodrome. As a result, there was probably no visible horizon. There is a high probability that low level cloud layers at about 2000 feet may have been of sufficient thickness and extent to totally obscure any starlight. The wind was from the north-west at 2 knots. The investigation found the aircraft was banked slightly right when it initially struck the tops of tall pine trees about 280 metres beyond, and 170 metres to the left of the extended centreline of runway 36. The aircraft travelled a further 220 metres before striking the ground at an angle of about 40 degrees. Both wings had been torn off prior to ground impact, the landing gear was extended and propeller damage was consistent with low RPM. Apart from a defect found in the fuel control unit, which may have resulted in engine rough running during power changes, the aircraft was considered to have been airworthy at the time of the accident. The pilot had been awake for almost 18 hours prior to the accident and may have been fatigued. His night flying experience, particularly related to dark night takeoffs remote from ground lights, was limited. The circumstances of the accident were consistent with the pilot suffering the effects of somatogravic illusion, a very subtle form of disorientation to which even experienced pilots can fall victim. When a pilot is subjected to climb and forward acceleration at the same time, and deprived of external visual cues, he experiences a strong sensation of a steeper than actual climb. It is this "false climb" illusion which tempts the pilot to lower the nose of the aircraft. This increases the forward acceleration component, and increases the illusion of climbing steeply. Owing to lag in the altimeter and vertical speed indicator, the loss of height may go unnoticed until it is too

late to avoid collision with the terrain. Somatogavic illusion can be overcome by anticipating and ignoring the illusion, establishing an appropriate climb attitude on the attitude indicator and confirming that the desired climb speed is achieved and maintained.

Significant Factors:

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

1. Very dark conditions for takeoff with no visible horizon.
2. Pilot may have been fatigued.
3. Limited pilot experience in the prevailing conditions.
4. Somatogavic illusion probably encountered by pilot during initial climb.
5. Failure to establish appropriate climb attitude by reference to the flight instruments.

Recommendations:

It is recommended that Civil Aviation Authority continues to ensure that pilots are educated about the subtle dangers of the somatogavic illusion, and the procedures to counteract it. In response to this and a similar previous recommendation, the Civil Aviation Authority intends publishing an article on the subject. The Authority is also going to advise the relevant sections of the aviation industry about the illusion.