

**Aviation Safety Investigation Report
199601209**

**Piper Aircraft Corp
Twin Comanche**

16 April 1996

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Occurrence Number: 199601209 **Occurrence Type:** Accident
Location: 3km S Charleville, Aerodrome
State: QLD **Inv Category:** 3
Date: Tuesday 16 April 1996
Time: 1917 hours **Time Zone** EST
Highest Injury Level: Fatal
Injuries:

	Fatal	Serious	Minor	None	Total
Crew	1	0	0	0	1
Ground	0	0	0	0	0
Passenger	0	0	0	0	0
Total	1	0	0	0	1

Aircraft Manufacturer: Piper Aircraft Corp
Aircraft Model: PA-30
Aircraft Registration: VH-EDG **Serial Number:** 30-1823
Type of Operation: Charter Positioning
Damage to Aircraft: Destroyed
Departure Point: Tanbar Station QLD
Departure Time: 1739 EST
Destination: Roma QLD

Crew Details:

Role	Class of Licence	Hours on	
		Type	Hours Total
Pilot-In-Command	Commercial	151.0	923

Approved for Release: Wednesday, February 5, 1997

FACTUAL INFORMATION

History of the flight

The pilot was conducting a charter flight from Roma to Quilpie, Windorah and Tanbar Station 100 km south-west of Windorah. The aircraft was refuelled at Windorah with 170.5 L of Avgas, and departed Windorah at 1400 EST for Tanbar. At 1739 the pilot transmitted flight-plan details to Brisbane Flight Service by radio for the flight to Roma. He advised that the flight would be conducted under the visual flight rules (VFR), and that the aircraft endurance was 250 minutes. He nominated a SARTIME of 2100 for his arrival at Roma.

At 1903 the pilot made an "all stations" broadcast 20 NM west of Charleville. He reported inbound on the 270 VOR radial on descent for a practice VOR approach, and said that after a missed approach he would proceed to Roma.

Witnesses at the airport saw the aircraft fly overhead from the west. The aircraft was seen to turn right onto a southerly heading and soon afterwards the sound of the aircraft diminished. A bang was then heard and felt through the ground at about 1915. The aircraft wreckage was located the next day by a search party. The aircraft had struck the ground whilst banked vertically to the right with a 45-degree nose-down attitude, and disintegrated.

Pilot in command

The pilot was correctly licensed and endorsed to conduct the flight. Prior to the accident flight, the pilot had only 3.9 hours multi-engine command night experience. Although 6.5 hours single-engine dual night experience was recorded, no multi-engine dual night experience was recorded. The pilot had flown the aircraft in command at night on only three previous occasions. These were on 11 and 12 December 1995 (2.1 hours), and on 4 April 1996 (1.8 hours). The pilot held an instrument rating, but the flight was being conducted under night VFR.

Meteorological conditions

The meteorological aerodrome report (METAR) for Charleville on 16 April 1996 at 1900 hours reported the wind to be a southerly at 6 kts, visibility more than 10 km, and no cloud below 5,000 ft. Witnesses said it was a very dark night with no moonlight.

The VHF omnidirectional radio range (VOR) approach

The pilot broadcast his intention to carry out a practice VOR approach at Charleville when he was 20 NM to the west. The VOR approach is designed to allow an aircraft to descend on specified VOR radials to a specified minimum descent altitude (MDA) in instrument meteorological conditions (IMC). The Charleville runway 12 VOR approach MDA is 1,750 ft or a height above the aerodrome of 727 ft.

To commence the procedure when approaching Charleville from the west, a sector entry is carried out. This entails passing over the aid (VOR) at the initial approach altitude of 2,800 ft, and turning right onto a heading of 146 degrees for 1 minute. The aircraft is then turned right to intercept the inbound leg of the holding pattern to overhead the aid. The position of the accident site suggests that this procedure had not been carried out, and that control of the aircraft was lost in the initial right turn from overhead.

Fuel quantity

The pilot refuelled at Windorah before proceeding to Tanbar. The main and auxiliary tanks were filled. No fuel was added to the tip tanks. The main tanks contained 204 L, and the auxiliary tanks 113.5 L, of useable fuel.

Engine instrument indications

During the on-site investigation the engine tachometers were recovered. The left engine tachometer was indicating 2,700 RPM, which is red-line or maximum RPM. The right engine tachometer was indicating 1,600 RPM, which is approximate flight-idle RPM. Both indicators were jammed in position by impact damage.

Fuel selector positions

The left and right fuel selectors and valves were recovered from the wreckage and specialist examination was carried out to determine the selector positions at impact.

The right fuel selector was found selected to MAIN. The selector pin was found secure in the handle although the selector knob was broken off. The pin was positively in the MAIN detent position. The right fuel-selector plate was minimally deformed with two of the three screws securing the plate to its base still in place. This means that the handle probably stayed in contact with the selector plate. That the pin remained, indicates that the selector was in MAIN for the whole impact sequence.

The left fuel-selector handle was found slightly anticlockwise from the MAIN position towards the AUX position. The left fuel-selector handle pin was deformed and depressed into the handle. The handle was thus free to move out of the detents. Examination of the left fuel selector showed deformation of the selector area, the handle subject to impact movement, multiple impact marks around the MAIN position, deformation of the selector plate around MAIN, a clear imprint of the handle above MAIN and an imprint in the plastic base of the selector in the MAIN position. The examination indicated that the left fuel selector was selected to MAIN at impact.

Exhaust pipe examination

Exhaust pipe sections from both engines were examined to assess the temperature at impact. Both exhaust pipe sections exhibited straw/gold coloured heat tinting. A temperature cannot be assigned accurately to a heat tinting colour, since the colour varies not only with temperature but with the time at that temperature. However, the presence of heat tinting does indicate that the exhaust pipes were hot (above 350 deg. C) at the time of impact, and that the engines were operating immediately prior to impact.

Aircraft and engines

Examination of the wreckage did not reveal any defects which may have contributed to the accident. There were no mechanical defects found on the engines which would have prevented the engines from developing normal power.

Emergency locator transmitter

The ACK Technologies emergency locator transmitter (ELT) (which complied with TSO C91a) was found outside the main wreckage unattached. The case was intact and the three-position (ON-OFF-ARM) function switch was in the centre OFF position. The switch was not guarded and may have been moved in the impact sequence. The unit was functionally tested and found serviceable.

ANALYSIS

At the time of the accident, there was no moon and the aerodrome pilot activated lighting (PAL) had not been turned on. After passing over the township, which is to the north of the aerodrome, the pilot would have had no visual horizon. The pilot's multi-engine experience at night was 3.9 hours, all of which was in command.

The flight times since the last refuelling at Windorah to arrival overhead at Charleville corresponded to that required to exhaust auxiliary fuel tanks. The pilot was known to have allowed auxiliary tanks to run dry before selecting mains on previous occasions. The fuel supply to the right engine may have been interrupted due to exhaustion of the right auxiliary tank. The operating handbook cautions against using auxiliary tanks in other than level flight due to the possibility of uncovering the tank outlet. Should this occur the engine is likely to lose power, surge and stop. Once the fuel system has ingested air, the engine cannot be restarted until the air is purged and a normal fuel flow restored. The fuel selectors appear to have been selected to the main tanks at impact, but as indicated by the engine tachometer readings, the right engine was not delivering power. This was most likely due to the right engine fuel system having ingested air before the main tank was selected.

The possibility of the pilot carrying out a deliberate asymmetric approach was considered. However, this would seem unlikely due to the demanding nature of the exercise and the pilot's low experience on type at night.

An unexpected power loss while the pilot's attention is concentrated on the flight instruments could be most distracting, even for an experienced pilot. The effect would be for his attention to be immediately diverted to the engine instruments, and then possibly the fuel panel. Cross reference between the attitude and performance instruments is required to perform instrument flight, particularly when there is no visual horizon. This is critical in multi-engine aircraft if an engine fails and asymmetric flight is encountered. Should cross-reference be lost for any reason and the aircraft allowed to get into unbalanced, uncoordinated flight, the aircraft may assume an unusual attitude. The pilot may then become completely disorientated and lose control of the aircraft.

The aircraft attitude at impact suggests that this occurred.

SIGNIFICANT FACTORS

1. The pilot was inexperienced on multi-engine aircraft at night, and had not undergone night flying training on the aircraft type.
2. The aircraft carried sufficient fuel for the flight, and it is likely that auxiliary tank fuel was depleted or nearly depleted when the aircraft arrived overhead Charleville.
3. The weather was fine, but with no moon and no visible horizon, was unsuitable for VFR operations at night.
4. The pilot was conducting a practice VOR approach at Charleville.
5. The right engine was not developing power, most probably due to fuel starvation.
6. The pilot lost control of the aircraft for undetermined reasons during a practice instrument approach and the aircraft impacted the ground.