

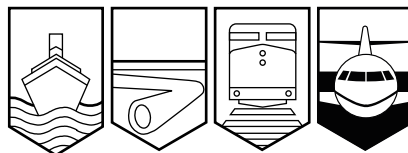
Transportation Safety Board
of Canada



Bureau de la sécurité des transports
du Canada

AVIATION INVESTIGATION REPORT

A00P0244



CONTROLLED FLIGHT INTO TERRAIN – ON APPROACH

**PIPER AEROSTAR 602P N88AT
OKANAGAN MOUNTAIN, BRITISH COLUMBIA
31 DECEMBER 2000**

Canada

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

Aviation Investigation Report

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Summary

The Piper Aerostar 602P aircraft, registration N88AT, serial number 62P08628165003, with the pilot, who was also the owner, three passengers, and two dogs on board, took off from the Salt Lake City Airport, Utah, on an instrument flight rules flight to Penticton, British Columbia. At 1149 Pacific standard time, the Kamloops/Castlegar sector controller of Vancouver Centre passed N88AT a special weather observation for Penticton: “winds calm; visibility $\frac{3}{4}$ mile in snow; sky obscured; vertical visibility 700 feet; remarks snow eight [8/8 of the sky covered]; temperature zero; 1900 [1100 Pacific standard time] altimeter 30.21.” When approaching Penticton, the pilot requested the localizer distance-measuring equipment B (LOC DME-B) approach to runway 16. When the pilot confirmed that he could complete the procedure turn within 13 miles of the Penticton airport, the controller issued an approach clearance for the LOC DME-B approach, with a restriction to complete the procedure turn within 13 miles of the Penticton airport. This restriction was to prevent possible conflicts between N88AT and aircraft taking off or carrying out missed approaches from runway 15 at Kelowna.

The pilot reported to the Penticton Flight Service Station at 1203 Pacific standard time that he was by the Penticton non-directional beacon (NDB) outbound on the localizer, and he was given the latest runway condition report. When the aircraft then failed to respond to numerous radio calls from the Penticton Flight Service Station and Vancouver Centre, search and rescue staff were notified and a search initiated. The wreckage was found two days later, near the summit of Okanagan Mountain, in a wooded area, at an elevation of about 5100 feet above sea level. There were no survivors. The aircraft was destroyed but did not catch fire.

Ce rapport est également disponible en français.

Other Factual Information

The pilot held a private pilot licence and a second class medical certificate, both issued by the United States Federal Aviation Administration (FAA). The licence was endorsed for single- and multi-engine aeroplanes and for an instrument rating. The medical certificate, which had a restriction that corrective lenses be worn while flying, was issued on 2 November 1998 and was valid for a period of 24 calendar months, and had therefore expired. The pilot had accumulated approximately 2500 flying hours, the majority on light, twin-engine aircraft, including the Aerostar 602P. He was qualified to operate the aircraft under instrument flight rules (IFR). An autopsy of the pilot did not reveal any condition that could have led or contributed to the accident.

Records indicate that the aircraft was certified, equipped, and maintained in accordance with existing FAA regulations and approved procedures. The aircraft was manufactured in 1981 and had flown a total of 3052.3 hours as of 28 December 2000. A review of the journey and technical logbooks and engine logbooks showed nothing remarkable. As of 28 December 2000, both the left engine, Lycoming IO-540 series, model AA1A5, serial number L-20934-48A, and the right engine, serial number L-20903-48A, had accumulated 3052.3 hours total since new.

The aircraft was equipped for instrument flight, including distance measuring equipment (DME), a radio altimeter, and a global positioning system.

The aircraft struck one of two communication towers on the summit of Okanagan Mountain, which is at an elevation of 5164 feet above sea level (asl). The left wing tip struck a microwave dish antenna, near the top of the 157-foot tower, while the aircraft was in a right bank, and aircraft debris from the wing tip was found at the base of the tower. The aircraft departed controlled flight and, likely tumbling, continued airborne down the slope just above the trees for a distance of about 160 metres in a direction of 140 degrees magnetic. The aircraft then struck a tree and broke apart. Because of the severity of the impact, the accident was not survivable.

Bad weather in the Penticton area precluded an air search, so a ground search using snowmobiles was organized. The wreckage was found two days later.

The wreckage was examined at the accident site for pre-impact defects; none was found, and all control surfaces were accounted for. An examination of the engines and their components and systems revealed no pre-impact defect or anomaly that could have caused a loss of engine performance. The condition of the propellers indicated that both engines were operating at the time of impact. All damage to the engines was determined to be associated with the impact. The power the engines were producing at impact, however, could not be precisely determined by site examination.

The emergency locator transmitter was found destroyed by impact forces. Its switch was found in the armed position, but the transmitter did not operate.

As shown in Appendix A, the LOC DME-B approach at Penticton, a non-precision approach, commences at the Penticton non-directional beacon (YYF NDB) at a minimum altitude of

7500 feet. A pilot carrying out this approach is expected to then do the following:

- track outbound on the localizer, past the UNT (Naramata) NDB until 10 DME;
- make a left procedure turn at a minimum altitude of 6500 feet, completing the turn within 14.1 DME [using DME from XYF 110.3];
- proceed inbound on the localizer at a minimum altitude of 5900 feet until 10 DME;
- descend to a minimum of 5500 feet at the UNT NDB; and
- descend to a minimum of 2980 feet to the YYF NDB, the missed approach point.

Radar data show the aircraft passed the YYF NDB at 11 000 feet at a speed of 200 knots. It then tracked outbound on the localizer at a speed of 180 knots at a descent rate of 1100 feet per minute until passing the UNT NDB, whereupon the descent rate increased to 1500 feet per minute. After passing the UNT NDB at an altitude of 9000 feet, the aircraft continued to track the localizer for one minute to 13 DME, and then turned left to the outbound procedure turn heading of 295 degrees magnetic. The aircraft descended through the minimum procedure turn altitude of 6500 feet at a rate of 1740 feet per minute. After approximately 45 seconds the aircraft began a right turn and levelled off at 5500 feet, while continuing the turn to about 120 degrees magnetic at a distance of 16 DME. The aircraft disappeared from radar just prior to intercepting the localizer, coincident with a two-second carrier wave transmitted on the Flight Service Station frequency.

The altimeter was recovered; it was set to 30.21 inches, the latest Penticton setting. Pressure altimeters are calibrated to indicate true altitude under International Standard Atmospheric (ISA) conditions. Any deviation from ISA will result in an erroneous reading on the altimeter. When the temperature is lower than ISA, the true altitude will be lower than the figure indicated on the altimeter. Altitude correction charts are provided for pilots to assist in calculating the height correction to be applied for temperatures of zero and lower.

As there was no other traffic at Penticton, the controller, having issued the approach clearance to N88AT with a restriction to complete the procedure turn within 13 nautical miles of the Penticton airport, then turned his attention to traffic movements at two other airports and did not notice N88AT's deviations from the approach procedure.

The weather conditions at Penticton, at the time of the accident, were such that a successful landing was very unlikely. Under *Canadian Aviation Regulations*, however, a pilot may carry out an instrument approach in such conditions, even though the likelihood of completing it successfully may be minimal.

Analysis

The examination of the aircraft, engines and ancillary systems revealed no defects that could have led to the accident.

The pilot tracked outbound on the localizer for one minute from the UNT NDB, and his procedure turn commenced at 13 DME. This was 3 nautical miles (nm) past the 10 DME turning point depicted on the approach chart and already at the controller / pilot agreed limit. The delay in starting the procedure turn resulted in the aircraft reaching 16 DME before the turn was

completed, 1.9 nm past the chart limit. The aircraft was 1000 feet below the minimum altitude for the procedure turn, and as the aircraft turned to intercept the localizer, it was 400 feet lower than the minimum safe altitude for that area, which is 5900 feet asl.

The aircraft was approximately 5500 feet asl when it struck the tower, and the top of the tower was at a true altitude of 5321 feet. The temperature at Penticton Airport was 0°C, and the temperature correction for the aircraft's altimeter, when reading 5500 feet, was about 100 feet. The aircraft's true altitude was, therefore, about 5400 feet. Small errors in the aircraft's altimeter or a deviation from 5500 in the last few seconds of flight could easily have resulted in the aircraft being lower than the top of the tower.

It could not be determined why the pilot flew the aircraft below the minimum procedure turn altitude. The altimeter setting was correct, and the aircraft's altitude over the YYF NDB, as recorded on the radar tape, was exactly 11 000 feet asl, the altitude to which the flight was cleared. It is concluded from these facts that the pilot must have been seeing the altitudes on his altimeter that coincide with the recorded altitudes. Also, it is not known why he flew 3 nm past the procedure turn point prior to turning left onto the procedure turn.

It could be assumed from the reported weather conditions that the aircraft was in cloud or snow showers for the entire approach. The weather probably affected the flight, but the extent is not known.

Findings as to Causes and Contributing Factors

1. For reasons not determined, the pilot did not adhere to the procedures depicted for the LOC DME-B approach to runway 16 at Penticton. As a result, the aircraft did not remain within the confines of protected airspace, was below the minimum safe altitude for the procedure turn, and struck the tower.

Findings as to Risk

1. The approach was flown in weather conditions that virtually precluded the pilot from completing a landing.

Other Findings

1. The pilot's flight medical certificate had expired one month prior to the accident, and no information could be found that he had submitted to an FAA medical during that time.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 18 September 2001.

Appendix A - Penticton Approach Chart

