

**AVIATION OCCURRENCE REPORT**

**IN-FLIGHT COLLISION WITH TREES**

**GC-AIR NORD INC.  
BEECH A100 KING AIR C-GAVI  
PETERBOROUGH, ONTARIO  
08 FEBRUARY 1996**

**REPORT NUMBER A96Ø0021**

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.

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#### Summary

The pilot was on a solo instrument flight rules (IFR) ferry flight in the Beech King Air A100 from Quebec City, Quebec, to Peterborough, Ontario. While the pilot was conducting the non-directional beacon (NDB) instrument approach (NDB RWY 09) at Peterborough, the aircraft struck trees in the area of the procedure turn. At the time that the pilot was cleared for the approach, the weather at Peterborough was 400 feet overcast and two miles visibility in light drizzle and fog. While the pilot was flying the approach, the ceiling and visibility lowered to 200 feet and one mile respectively. The minimum descent altitude on the approach was 1,200 feet above sea level (asl), 575 feet above the touchdown zone elevation (TDZE).

After the aircraft struck the trees, the pilot applied full power, retracted the flaps and landing gear, and commenced a climb. The pilot then advised air traffic control (ATC) of his situation, and, when he recognized that the aircraft right wing fuel tank was leaking fuel, he accepted radar vectors to the military aerodrome at Trenton, Ontario. The pilot safely landed the substantially damaged aircraft with the airport emergency rescue services deployed. The weather in Trenton when the aircraft landed was 100 feet overcast cloud with one and one-quarter mile visibility in drizzle and fog.

*Ce rapport est également disponible en français.*

### **Other Factual Information**

The pilot held an Airline Transport Pilot Licence and had about 7,800 hours flying time, 4,500 hours on twin-engine aircraft.

The aircraft approached the Peterborough airport from the east and was cleared for an unspecified approach; the pilot elected to conduct the NDB RWY 09 approach. As the aircraft proceeded outbound from the Peterborough beacon, in descent to the procedure turn altitude of 2,600 feet asl, the pilot's instrument approach chart fell from his knee pad to the cockpit floor. He was using the *Canada Air Pilot* (CAP 4) instrument procedures booklet, which was not secured to his knee pad.

The pilot was unable to immediately recover the approach chart and continued to fly the approach in instrument meteorological conditions (IMC), from memory. The final approach fix crossing altitude was 1,800 feet asl; however, as the pilot turned to the final track intercept heading of 042 degrees magnetic in the procedure turn, he prematurely descended to 1,800 feet asl.

At this time, the pilot attempted to retrieve the approach chart, and the aircraft descended below 1,800 feet asl. As the pilot looked up, he saw tree tops which the aircraft struck at about 1,100 feet asl. The pilot immediately applied maximum power, raised the flaps and landing gear, and commenced a climb. He advised ATC that he was on the missed approach and requested clearance to Toronto, Ontario. The controller advised the pilot of the weather at Toronto and Ottawa, Ontario, and the pilot then elected to proceed to Ottawa.

While on radar vectors for the on-course to Ottawa, the pilot advised the controller that the aircraft had struck trees during the approach into Peterborough and that the aircraft was leaking fuel. The controller suggested that the pilot could obtain a precision approach radar (PAR) approach at the military aerodrome at Trenton, and the pilot accepted radar vectors to Trenton.

After the landing in Trenton, inspection of the aircraft revealed damage to the right propeller, engine cowl, right wing leading edge, fuel tanks, right outboard flap, and the underside of the aircraft.

There was evidence of several tree impacts in these areas and on the right main and nose landing gear.

During the approach at Peterborough, the pilot flew the aircraft with the autopilot heading mode engaged. The autopilot altitude hold mode was available, but the pilot did not use it.

### **Analysis**

A single pilot, flying a non-precision instrument approach in IMC in this category of aircraft, is in a high workload situation that would require his full attention and flying ability. Although the pilot was using the autopilot in the heading mode selection, he was not using altitude hold and was manually flying and controlling the aircraft power and altitude during the approach.

When the CAP 4 containing the applicable approach chart fell to the cockpit floor, the pilot was unable to quickly retrieve it. He elected to continue the instrument approach from memory until he could retrieve the approach chart. Without reference to the approach chart, the pilot incorrectly descended 800 feet below the procedure turn altitude and then attempted to retrieve the CAP 4. His attention was diverted away from flying the aircraft at a critical phase of the flight, and the pilot inadvertently allowed the aircraft to descend about another 700 feet until it struck the trees. Fortunately, the pilot was able to initiate an overshoot and land the damaged aircraft at a diversion aerodrome.

### **Findings**

1. While the pilot was conducting the approach procedure, the approach chart fell from his knee pad to the floor of the aircraft.
2. Without reference to the approach chart, the pilot prematurely descended the aircraft to the final approach fix crossing altitude prior to establishing the aircraft on the inbound track.
3. The pilot did not use the autopilot altitude hold mode while attempting to recover the approach chart.
4. The pilot did not monitor the aircraft flight instruments while attempting to retrieve the approach chart, and the aircraft descended and struck trees.

### **Causes and Contributing Factors**

The pilot did not adequately monitor the aircraft flight instruments while flying a non-precision approach in instrument meteorological conditions. Contributing to the accident was the pilot's decision to continue to fly the approach procedure from memory.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson, Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 09 October 1996.*