

AVIATION OCCURRENCE REPORT

CONTROLLED FLIGHT INTO TERRAIN

**TRANS PROVINCIAL AIRLINES
PIPER PA-31-350 CHIEFTAIN C-GKIY
TERRACE, BRITISH COLUMBIA 39 nm N
22 OCTOBER 1990**

REPORT NUMBER A90P0340

Canada

MANDATE OF THE TSB

The Canadian Transportation Accident Investigation and Safety Board Act provides the legal framework governing the TSB's activities. Basically, the TSB has a mandate to advance safety in the marine, pipeline, rail, and aviation modes of transportation by:

- conducting independent investigations and, if necessary, public inquiries into transportation occurrences in order to make findings as to their causes and contributing factors;
- reporting publicly on its investigations and public inquiries and on the related findings;
- identifying safety deficiencies as evidenced by transportation occurrences;
- making recommendations designed to eliminate or reduce any such safety deficiencies; and
- conducting special studies and special investigations on transportation safety matters.

It is not the function of the Board to assign fault or determine civil or criminal liability. However, the Board must not refrain from fully reporting on the causes and contributing factors merely because fault or liability might be inferred from the Board's findings.

INDEPENDENCE

To enable the public to have confidence in the transportation accident investigation process, it is essential that the investigating agency be, and be seen to be, independent and free from any conflicts of interest when it investigates accidents, identifies safety deficiencies, and makes safety recommendations. Independence is a key feature of the TSB. The Board reports to Parliament through the President of the Queen's Privy Council for Canada and is separate from other government agencies and departments. Its independence enables it to be fully objective in arriving at its conclusions and recommendations.



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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Synopsis

The aircraft departed on a flight from Bronson Creek to Terrace, British Columbia, but did not arrive at its destination. An air and ground search was conducted, but the aircraft was not found, and the search was abandoned. The aircraft was found by chance almost four years later. The aircraft struck the trees in controlled level flight with the engines producing power. The pilot and three passengers did not survive the impact.

The Board determined that the pilot likely attempted to continue the visual flight into an area of instrument meteorological conditions.

NOTE: This report supersedes the Board's previous report of the same number, released in April 1992. Finding the aircraft provided some new evidence, and this report reflects all of the evidence gathered.

Ce rapport est également disponible en français.

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1.0 *Factual Information*

1.1 *History of the Flight*

The aircraft was on a scheduled visual flight rules (VFR)¹ flight from Terrace to Iskut to Dease Lake to Bronson Creek and back to Terrace, British Columbia. The aircraft departed Terrace about 1005 Pacific standard time (PST)² and arrived Iskut about 1145, departed Iskut about 1155 and arrived Dease Lake about 1230, and departed Dease Lake about 1250 and arrived Bronson Creek about 1340. All of these flights were completed without incident, and the aircraft departed Bronson Creek for Terrace at about 1350 with the pilot and three passengers on board. Ten minutes later, the pilot spoke on the radio to a pilot who was flying from Smithers to Bronson Creek when the two aircraft passed each other approximately 20 miles east of Bronson Creek. This was in the Iskut River valley just east of the confluence of the Forest Kerr River and the Iskut River. This was the last reported contact with the aircraft, and the pilot did not report a problem at that time.

An air and ground search was started after the aircraft was reported missing, but the aircraft was not found and the search was abandoned. No emergency locator transmitter (ELT) signal was detected. The wreckage was found by chance on 05 August 1994, nearly four years after the accident. (See Appendix A.)

1.2 *Injuries to Persons*

	Crew	Passengers	Others	Total
Fatal	1	3	-	4
Serious	-	-	-	-
Minor/ None	-	-	-	-
Total	1	3	-	4

¹ See Glossary for all abbreviations and acronyms.

² All times are PST (Coordinated Universal Time [UTC] minus eight hours) unless otherwise indicated.

1.3 *Damage to Aircraft*

The aircraft wreckage was found about 39 miles north of Terrace, and about 5 miles east of the Tseax River valley. The Tseax River valley is the main VFR route north of Terrace. The evidence from the tree damage and the wreckage pattern indicated that the aircraft hit the trees in straight and level flight on a heading of about 360 degrees magnetic. The accident site was about 3,500 feet above sea level (asl), on steeply sloping terrain covered with sub-alpine vegetation. The aircraft broke up on impact, and the accident was not survivable. No human remains were found at the site, apart from a few small bones.

A post-crash fire consumed the upper part of the fuselage; however, all of the other parts of the aircraft were recovered. Damage to the propeller blades indicated that the engines were producing power at impact.

The ELT and the instruments that were not destroyed by fire were sent to the TSB Engineering Branch laboratory for examination. The dual engine fuel pressure indicator face and the dual engine exhaust gas temperature indicator face both had pointer imprints in the normal engine operating range. The examination of the ELT indicated that it was probably serviceable prior to impact, but it failed to transmit a signal as the crystal was damaged by the impact.

1.4 *Other Damage*

There was no other significant damage.

1.5 *Personnel Information*

	Captain
Age	67
Pilot Licence	ATPL
Medical Expiry Date	01 Nov 1990
Total Flying Hours	13,000
Hours on Type	1,000
Hours Last 90 Days	218
Hours on Type Last 90 Days	212
Hours on Duty Prior to Occurrence	5
Hours Off Duty Prior to Work Period	8

The pilot was qualified for the flight and was reported to have been healthy, well rested, and cheerful on that day. A review of his medical history confirmed his good health. The pilot had held an instrument rating since 1974 and had logged about 700 hours of instrument flight time; however, in the preceding two years, he had flown only in VFR weather. The pilot had not been successful in renewing his instrument rating in June 1990, as he was unable to maintain control of the aircraft with reference to the instruments and did not perform the necessary procedures to the required standards.

The pilot had flown this aircraft for two years, and he was very familiar with the area between Bronson Creek and Terrace, having flown in the area for 20 years.

1.6 Aircraft Information

Manufacturer	Piper
Type	PA-31-350 Chieftain
Year of Manufacture	1978
Serial Number	31-7852004
Certificate of Airworthiness (Flight Permit)	Valid
Total Airframe Time	5,520 hr
Engine Type (number of)	Lycoming LTIO-540-J2BD (2)
Propeller/ Rotor Type (number of)	Hartzell HC-E3YR (2)
Maximum Allowable Take-off Weight	7,000 lb
Recommended Fuel Type(s)	100/ 130, 100 LL
Fuel Type Used	100/ 130

The aircraft maintenance records showed that the aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures, and that there was no indication of mechanical problems. The instruments and avionics were serviceable, and the ELT had been recently checked. The aircraft was equipped with an autopilot, which was serviceable prior to the flight; however, it is not known if the pilot used the autopilot. The weight and centre of gravity were within the prescribed limits, and there was sufficient fuel on board for the planned flight.

1.7 Meteorological Information

The forecast weather for the area of the flight was cloud 1,500 feet asl to 2,500 feet asl scattered, variable broken, tops 5,000 feet asl, a few broken cumulus and embedded towering cumulus from 2,000 feet asl to 12,000 feet asl, giving light rain showers, occasional visibility a half to two miles in snow showers above 2,000 feet asl. Ceilings locally were forecast to be 200 to 800 feet above ground level, and visibilities zero to three miles in fog until 1700 Greenwich Mean Time (UTC). There were to be light rain showers and light snow showers, becoming isolated after 1500 UTC, surface winds from the southeast at 25 knots, gusting to 40 knots in exposed areas, moderate convective turbulence with towering cumulus, and moderate mechanical turbulence below 4,000 feet asl. The outlook was for marginal visual flight rules weather ceilings, with rain and fog, with occasional instrument flight rules weather ceilings, with rain and fog in the upslope areas.

At the time of the accident, the reported weather at Terrace (elevation 713 feet asl), the weather station closest to the accident site, was as follows: scattered cloud based at 500 and 1,200 feet above ground level (agl), overcast ceiling estimated 8,000 feet agl, visibility six miles in very light rain and smoke, temperature 6°C and dew point 4°C.

The aftercast for the weather in the area of the accident site indicated that there was heavy convective cloud based at 3,000 feet asl with moderate turbulence and patchy stratus cloud below 3,000 feet asl. Also, the freezing level was about 3,000 feet asl with heavy snow above and rain below, with the conditions deteriorating.

2.0 *Analysis*

2.1 *Controlled Flight into Terrain*

The evidence indicates that the aircraft was in straight and level controlled flight with both engines producing cruise power when it entered the trees.

The weather was not suitable for VFR flight in the mountainous terrain. The pilot was probably attempting to maintain visual flight below cloud and in poor visibility, and inadvertently flew into the trees. It was not possible to determine why the aircraft, which was going south to Terrace, crashed heading north; however, it is possible that the pilot was manoeuvring to avoid cloud, and struck the trees while heading north. The fact that the aircraft was found in the mountains five miles from the main VFR route to Terrace suggests that the pilot had either diverted to avoid weather, or had become lost while attempting to maintain a navigation course in the poor weather.

3.0 *Conclusions*

3.1 *Findings*

1. The aircraft struck the trees in straight and level flight with the engines producing cruise power.
2. The pilot did not pass his recent instrument rating check ride.
3. The aircraft was airworthy on departure from Terrace, and the ELT had been recently checked.
4. The weight and centre of gravity were within the prescribed limits, and there was sufficient fuel for the flight.
5. The ELT was damaged at impact and did not function.
6. The pilot was probably trying to avoid bad weather by flying low in the mountainous terrain when he inadvertently struck the trees.

3.2 *Causes*

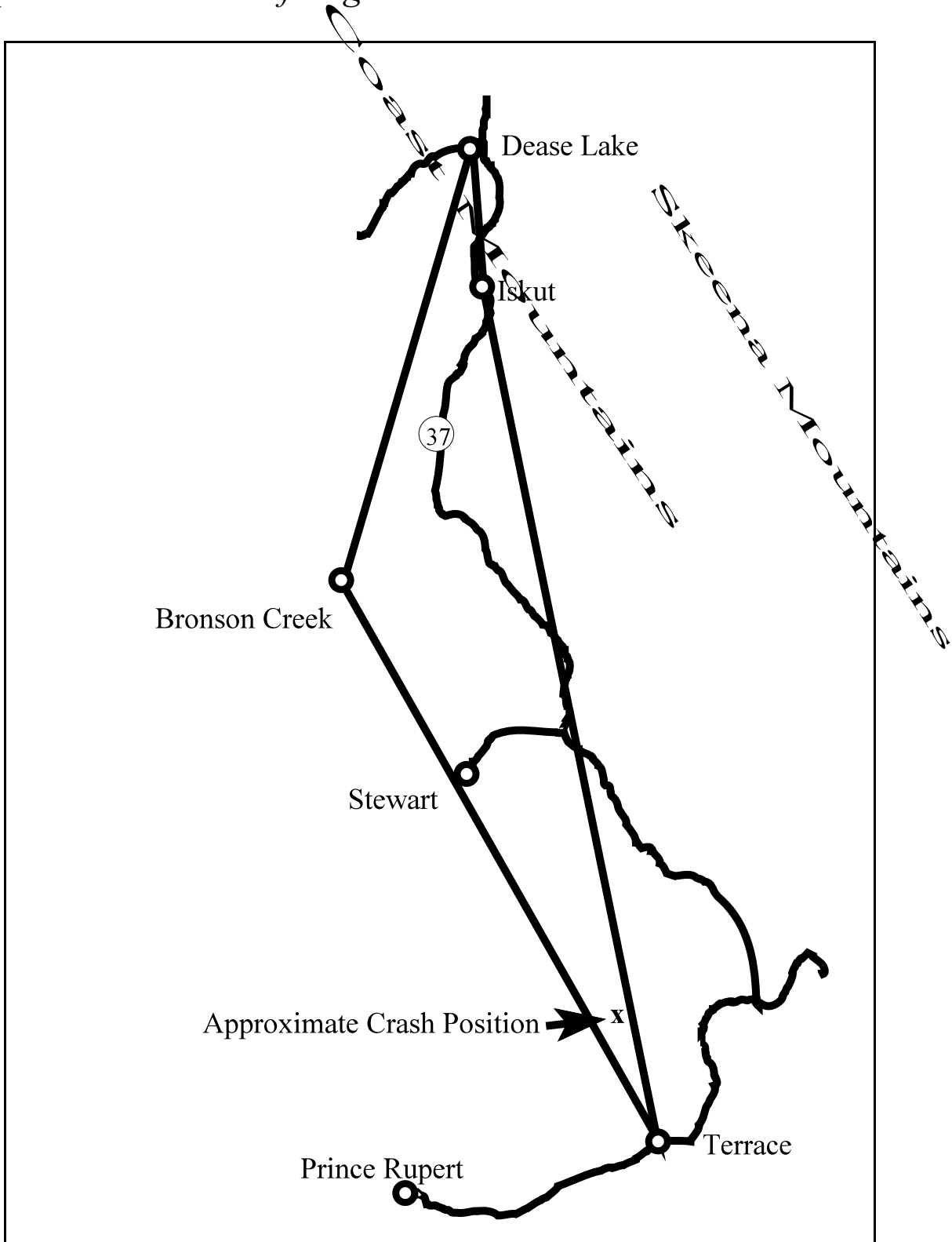
The pilot likely attempted to continue the visual flight into an area of instrument meteorological conditions.

4.0 *Safety Action*

The Board has no aviation safety recommendations to issue at this time.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson John W. Stants, and members Zita Brunet and Hugh MacNeil, authorized the release of this report on 27 September 1995.

Appendix A - Route of Flight and Crash Site



Appendix B - List of Supporting Reports

The following TSB Engineering Branch reports were completed:

LP 122/ 94 - ELT & Instruments Examination; and
LP 123/ 94 - Logbook Restoration.

These reports are available upon request from the Transportation Safety Board of Canada.

Appendix C - Glossary

agl	above ground level
asl	above sea level
ATPL	Airline Transport Pilot Licence
ELT	emergency locator transmitter
hr	hour(s)
lb	pound(s)
nm	nautical miles
PST	Pacific standard time
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time
VFR	visual flight rules

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