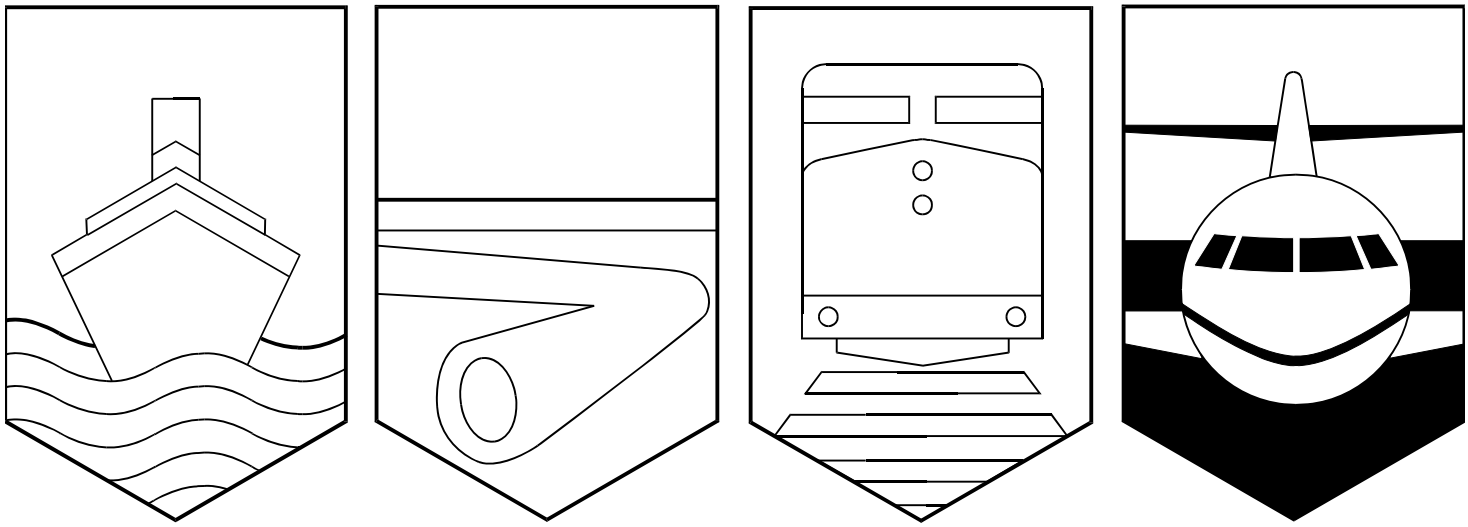
Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada



AVIATION OCCURRENCE REPORT

COLLISION WITH TERRAIN

CESSNA 150G C-FKMJ
CANMORE, ALBERTA 6 nm N
28 AUGUST 1994

REPORT NUMBER A94W0157

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.

Transportation Safety Board of Canada | Bureau de la sécurité des transports du Canada

Aviation Occurrence Report

Collision with Terrain

Cessna 150G C-FKMJ
Canmore, Alberta 6 nm N
28 August 1994

Report Number A94W0157

Synopsis

The pilot of the Cessna 150G aircraft was on a day visual flight rules flight from Airdrie, Alberta, to Nanaimo, British Columbia, with a planned fuel stop in Kelowna, British Columbia. The aircraft did not arrive at Kelowna or at its destination. Search and Rescue personnel found the aircraft the following morning about six miles north of Canmore, Alberta, in a box-end canyon at an elevation of 6,300 feet above sea level. The crash site was surrounded by 9,000-foot-high mountains. The emergency locator transmitter was instrumental in recovering the aircraft. The pilot and passenger sustained fatal injuries, and the aircraft was destroyed. The weather was not considered a factor in the occurrence.

The Board determined that the pilot entered a valley which terminated in a box-end canyon. The narrow canyon walls precluded a 180-degree turn back out of the canyon. While the pilot was attempting to climb above the steeply rising terrain, the aircraft stalled and crashed.

Ce rapport est également disponible en français.

Table of Contents

1.0 Factual Information

1.1 History of the Flight

The pilot and his step-son were in a Cessna 150G, C-FKMJ, on a visual flight rules (VFR)[1] flight from Airdrie, Alberta, to Nanaimo, British Columbia. The pilot had checked the en route weather, by telephone, with the Springbank Flight Service Station (FSS). He then filed a six-hour flight plan, with a 30-minute fuel stop in Kelowna, British Columbia. The aircraft departed Airdrie and reported airborne at 1556 mountain daylight saving time[2] (MDT). Minutes later the pilot requested and received the time of official darkness at Nanaimo. There were no further communications from the aircraft. The aircraft did not land at Kelowna or at its destination. A communications and airport search was carried out, but the aircraft was not located. An emergency locator transmitter (ELT) signal was picked up in the Canmore area by 1800; however, it was not believed to belong to the Cessna 150 as it was not yet overdue. Search and Rescue found the aircraft the following morning about six miles north of Canmore at an elevation of 6,300 feet above sea level[3] (asl) in a narrow, steep sided, box-end canyon, surrounded by 9,000-foot-high mountains. The pilot and passenger had sustained fatal injuries, and the aircraft was destroyed.

The accident occurred at latitude 51°11'N and longitude 115°14'W at approximately 1635, during the hours of daylight, at an elevation of 6,300 feet asl.

1.2 Injuries to Persons

	Crew	Passengers	Others	Total
Fatal	1	1	-	2
Serious	-	-	-	-
Minor/None	-	-	-	-
Total	1	1	-	2

1.3 Damage to Aircraft

The aircraft was destroyed.

1.4 Other Damage

There was no other damage.

1.5 Personnel Information

	Pilot
Age	45
Pilot Licence	PPL
Medical Expiry Date	22 April 1995
Total Flying Hours	600
Hours on Type	125
Hours Last 90 Days	15
Hours on Type Last 90 Days	15
Hours on Duty Prior to Occurrence	8
Hours off Duty Prior to Work Period	15

1.5.1 Other Pilot Information

1 See Glossary for all abbreviations and acronyms.

2 All times are MDT (Coordinated Universal Time [UTC] minus six hours) unless otherwise stated.

3 Units are consistent with official manuals, documents, reports, and instructions used by or issued to the crew.

The pilot enroled in a flying school in 1973, and was issued a Student Pilot Permit (SPP) on 20 November 1974 and his Private Pilot Licence (PPL) on 10 June 1975. He held a category III medical, and was classified as having monocular vision. He was required to wear glasses or contact lens while flying. On his last pilot medical form, dated 22 April 1994, he indicated he had flown 30 hours in the last 12 months. He was required to have an annual eye report; however, the last eye report on file submitted by the pilot was dated 06 April 1993, and there was no record of a 1994 eye exam in his medical file. A letter on his medical file states that Transport Canada was unable to make a medical assessment without an annual eye report. The Transport Canada medical assessment was required to validate the monocular pilot's private licence.

1.6 *Aircraft Information*

Manufacturer	Cessna Aircraft Company
Type and Model	150G
Year of Manufacture	1966
Serial Number	15065426
Certificate of Airworthiness (Flight Permit)	Valid
Total Airframe Time	2,301.1 hr
Engine Type (number of)	Teledyne Continental O-200 (1)
Propeller/Rotor Type (number of)	McCauley (fixed pitch) (1)
Maximum Allowable Take-off Weight	1,600 lb
Recommended Fuel Type(s)	80/87 Avgas
Fuel Type Used	80/87 Avgas

1.6.1 *Weight and Balance*

The aircraft's weight and centre of gravity were within normal limits.

1.7 *Meteorological Information*

On the day of the occurrence, the Alberta Weather office reported the following weather:

Synoptic Situation: A ridge of high pressure was dominant over the southern portion of Alberta with a high pressure centre north of Banff. A light dry westerly outflow from the high was evident along the eastern slopes of the Rocky Mountains. At the 500, 700, and 850 mb levels, a weak upper ridge was prevalent with dry stable conditions.

The Forecast: Dry, stable weather conditions were forecast for the occurrence area.

The Actual Weather: Observations from the region indicated generally clear conditions, with good prevailing visibility. Winds were light out of the west to southwest and, with the upper ridge dominant, there were no indications of any significant weather.

1.8 *Aids to Navigation*

The pilot was on a VFR flight from Airdrie direct to Banff and Lake Louise, Alberta, then to Revelstoke and Kelowna, British Columbia. After a 30-minute fuel stop in Kelowna, he planned on flying direct to Hope, Abbotsford, and then on to Nanaimo. During the wreckage examination, investigators found on board the aircraft, in the pilot's flight bag, maps for the intended route, a World Aeronautical Chart (WAC E-16), and a Vancouver VFR Navigation Chart. The Vancouver VFR chart has a scale of 1:500,000 and shows prominent VFR routes and valleys from Kamloops westward in great detail. The WAC E-16 chart has a scale of 1:1,000,000, and does not show as much detail, especially of prominent valleys and passes through the mountains. A copy of the Calgary VFR chart, which would show details of the route from Airdrie to Banff, was not found in the aircraft. A Canada VFR Supplement that expired 08 August 1981 was also on board. Log-book entries show that the pilot had flown

the Rocky Mountain routes on numerous other occasions.

1.9 Communications

Very high frequency (VHF) communications were established with Springbank and were satisfactory. The aircraft was not equipped with a transponder. A Pointer C4000 ELT was instrumental in locating the aircraft.

1.10 Wreckage and Impact Information

The aircraft struck the ground in a very steep, nose-down attitude on a magnetic heading of 295 degrees. The engine was pushed rearward and under the cabin. The propeller blades were twisted, and the leading edges were nicked in a manner that is typical when a propeller makes contact with trees and rocks while at a high power setting. The fuselage was buckled downward aft of the cabin area. The wings and empennage sustained heavy impact damage. The wing flaps were found in the retracted position. All control surfaces were accounted for, and all damage to the aircraft was attributable to severe impact forces. The aircraft damage pattern was consistent with that found when an aircraft strikes the ground while stalled as in a spin. Although the aircraft was not equipped with a shoulder harness, the occurrence was considered to be non-survivable due to the magnitude of the deceleration forces.

1.11 Medical Information

Based on the autopsy, toxicology, and medical records, there was no evidence to indicate that the pilot's performance was degraded. He was classed as being monocular; however, this was not considered to be a factor in the occurrence. A broken pair of prescription eye glasses was found in the cockpit area.

1.12 Additional Information

1.12.1 Wing Flap System

The pilot's notebook listed several aircraft minor discrepancies, including a notation that the flap motor fuse was unserviceable. The pilot's "Daytimer" indicated that a fuse was replaced at the Springbank Airport on 22 August 1994. During the post-crash inspection, the flap motor and fuse were checked and found to operate normally. The flap switch, which was impact damaged, was disassembled, and the electrical contacts were found to be dirty and badly burned. This may have resulted in an intermittent switch operation.

1.12.2 Flight Planning

The pilot's flight plan indicated a planned en route altitude of 9,000 feet asl.

The direct route from Airdrie to Banff will take a pilot along a route to the north of the Calgary International Airport and Springbank Airport control zones to the Ghost River. About 10 miles west of the mountains is the south fork of the Ghost River. This south fork valley terminates in a box-end canyon surrounded by mountains up to 9,000 feet high. The canyon is very narrow in the area of the occurrence. The main fork of the Ghost River enters the eastern shores of Lake Minnewanka at an elevation of about 4,850 feet asl, with Banff a short distance from the western shores. It is believed that the pilot had intended to take the main fork of the Ghost River to Banff, rather than the south fork of the river.

2.0 Analysis

2.1 Introduction

The analysis will concentrate on pilot decision making and judgement, as there was no evidence found to indicate that the weather, the aircraft mechanical condition, or pilot incapacitation were factors in the occurrence.

2.2 Pilot Decision Making and Judgement

Although the pilot had flight planned for an en route altitude of 9,000 feet asl, the location of the wreckage at 6,300 feet asl suggests that he may have entered the box-end south Ghost River canyon at a lower altitude and been unable to turn around or climb above the canyon walls. Conducting a 180-degree turn out of the canyon would probably not have been possible. The wreckage pattern, which appears consistent with a stall/spin occurrence, indicates that the pilot failed to maintain adequate airspeed while trying to climb above the steep, narrow terrain. If the pilot had inadvertently entered the canyon at 9,000 feet, he probably would have been able to climb over the box-ends which are at the same altitude, or conduct a 180-degree turn back out of the canyon.

The pilot had flown the route previously and appears to have had sufficient confidence in his navigational abilities that he did not consider it necessary to carry or refer to a Calgary VFR map that showed the details of the mountain pass into Banff.

3.0 Conclusions

3.1 Findings

1. The pilot entered a box-end canyon at too low an altitude to turn around or climb over the canyon walls.

2. Evidence indicates the pilot failed to maintain adequate airspeed and allowed the aircraft to stall.

3. No evidence was found that the annual eye examination, which was required to medically validate the monocular pilot's private licence, had been obtained.

4. The burned, dirty contacts in the flap switch may have resulted in intermittent operation, and may have rendered the flap system inoperative.

5. The lack of a Calgary VFR map deprived the pilot of critical information on the correct route through the mountains.

6. The ELT was instrumental in locating the aircraft.

3.2 Causes

The pilot entered a valley which terminated in a box-end canyon. The narrow canyon walls precluded a
180-degree turn back out of the canyon. While the pilot was attempting to climb above the steeply rising terrain, the aircraft stalled and crashed.

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 19 May 1995.

Appendix A - Glossary

asl	above sea level
ELT	emergency locator transmitter
FSS	Flight Service Station
hr	hour(s)
lb	pound(s)
mb	millibar(s)
MDT	mountain daylight saving time
N	north
nm	nautical miles
PPL	Private Pilot Licence
SPP	Student Pilot Permit
TSB	Transportation Safety Board of Canada
UTC	Coordinated Universal Time
VFR	visual flight rules
VHF	very high frequency
W	west
WAC	world aeronautical chart
"	second(s)
°	degree(s)

TSB OFFICES

HEAD OFFICE

HULL, QUEBEC*
Place du Centre
4th Floor
200 Promenade du Portage
Hull, Quebec
K1A 1K8
Phone (819) 994-3741
Facsimile (819) 997-2239

ENGINEERING
Engineering Laboratory
1901 Research Road
Gloucester, Ontario
K1A 1K8
Phone (613) 998-8230
24 Hours (613) 998-3425
Facsimile (613) 998-5572

*Services available in both official languages

REGIONAL OFFICES

ST. JOHN'S, NEWFOUNDLAND
Marine
Centre Baine Johnston
10 Place Fort William
1st Floor
St. John's, Newfoundland
A1C 1K4
Phone (709) 772-4008
Facsimile (709) 772-5806

GREATER HALIFAX, NOVA SCOTIA*
Marine
Metropolitain Place
11th Floor
99 Wyse Road
Dartmouth, Nova Scotia
B3A 4S5
Phone (902) 426-2348
24 Hours (902) 426-8043
Facsimile (902) 426-5143

MONCTON, NEW BRUNSWICK
Pipeline, Rail and Air
310 Baig Boulevard
Moncton, New Brunswick
E1E 1C8
Phone (506) 851-7141
24 Hours (506) 851-7381
Facsimile (506) 851-7467

GREATER MONTREAL, QUEBEC*
Pipeline, Rail and Air
185 Dorval Avenue
Suite 403
Dorval, Quebec
H9S 5J9
Phone (514) 633-3246
24 Hours (514) 633-3246
Facsimile (514) 633-2944

GREATER QUÉBEC, QUEBEC*
Marine, Pipeline and Rail
1091 Chemin St. Louis
Room 100
Sillery, Quebec
G1S 1E2
Phone (418) 648-3576
24 Hours (418) 648-3576
Facsimile (418) 648-3656

GREATER TORONTO, ONTARIO
Marine, Pipeline, Rail and Air
23 East Wilmot Street
Richmond Hill, Ontario
L4B 1A3
Phone (905) 771-7676
24 Hours (905) 771-7676
Facsimile (905) 771-7709

PETROLIA, ONTARIO
Pipeline and Rail
4495 Petrolia Street
P.O. Box 1599
Petrolia, Ontario
N0N 1R0
Phone (519) 882-3703
Facsimile (519) 882-3705

WINNIPEG, MANITOBA
Pipeline, Rail and Air
335 - 550 Century Street
Winnipeg, Manitoba
R3H 0Y1
Phone (204) 983-5991
24 Hours (204) 983-5548
Facsimile (204) 983-8026

EDMONTON, ALBERTA
Pipeline, Rail and Air
17803 - 106 A Avenue
Edmonton, Alberta
T5S 1V8
Phone (403) 495-3865
24 Hours (403) 495-3999
Facsimile (403) 495-2079

CALGARY, ALBERTA
Pipeline and Rail
Sam Livingstone Building
510 - 12th Avenue SW
Room 210, P.O. Box 222
Calgary, Alberta
T2R 0X5
Phone (403) 299-3911
24 Hours (403) 299-3912
Facsimile (403) 299-3913

GREATER VANCOUVER, BRITISH COLUMBIA
Marine, Pipeline, Rail and Air
4 - 3071 Number Five Road
Richmond, British Columbia
V6X 2T4
Phone (604) 666-5826
24 Hours (604) 666-5826
Facsimile (604) 666-7230