Aviation Investigation Final Report

Location:	DETROIT LAKES, Minnesota	**Accident Number:**	CHI99FA264
Date & Time:	July 29, 1999, 14:20 Local	**Registration:**	N6996R
Aircraft:	Beech C23	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

A witness reported that the airplane lifted-off runway 13 (4,500 feet by 75 feet, dry/asphalt) approximately 600 feet from the end of the runway. The witness reported that that airplane climbed to an altitude of 150-200 feet above the ground before it began an increasing left banking turn. The witness stated that the airplane was climbing in a nose high pitch attitude and that the airplane's bank angle was approximately 50-60 degrees with the airplane's nose began to pitch down. The witness reported that the airplane's maximum nose-down pitch angle was 70-80 degrees at the time of the impact with terrain. No anomalies were found with the airframe structure or its systems that could be associated with a preexisting condition. No anomalies were found with the aircraft engine or its systems that could be associated with a preexisting condition. The active ingredient of marijuana (Tetrahydrocannabinol) and its metabolite substance (Tetrahydrocannabinol Carboxylic Acid) was found during a Federal Aviation Administration (FAA) Toxicology examination. The levels of Tetrahydrocannabinol and Tetrahydrocannabinol Carboxylic Acid found in the pilot's tissues and fluids would be consistent with the direct inhalation of marijuana less than one-hour before the time of the accident. According to the book entitled, 'Fit To Fly A Pilot's Guide to Health & Safety', author Richard O. Reingart MD, the active ingredient in marijuana is, '...THC (delta 9 tetra hydrocannibinal)....' The book continues, 'THC causes temporary euphoria and relaxation. However, more than alcohol, it distorts perception, weakens critical judgment, and interferes with the ability to concentrate. THC also increases heart rate and the incidence of cardiac arrhythmias. Short term memory is impaired, IQ is thought to be diminished, and there is a decrease in reaction time and tracking (similar to alcohol).'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Aircraft control not obtained/maintained by the pilot. A factor to the accident was the pilot's impairment due to drugs.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) AIRCRAFT CONTROL - NOT OBTAINED/MAINTAINED - PILOT IN COMMAND
2. (F) IMPAIRMENT(DRUGS) - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Occurrence #3: FIRE/EXPLOSION
Phase of Operation: OTHER

Factual Information

HISTORY OF FLIGHT

On July 29, 1999, at 1420 central daylight time, a Beechcraft C23, N6996R, piloted by a commercial pilot, was destroyed during an in-flight collision with terrain and subsequent postimpact fire shortly after a takeoff from runway 13 (4,500 feet by 75 feet, dry/asphalt) at the Detroit Lakes Airport, Detroit Lakes, Minnesota. Visual meteorological conditions prevailed at the time of the accident. The positioning flight was operating under the provisions of 14 CFR Part 91 and was not operating on a flight plan. The pilot, who was the sole occupant, was fatally injured. The flight was originating at the time of the accident with exact destination unknown.

A witness stated that the takeoff run was uneventful, with the airplane lifting-off the runway approximately 600 feet from the end of the runway. The witness reported that the airplane climbed to an altitude of 150-200 feet above ground level (agl) before it began an increasing left banking turn toward the north. The witness reported that the airplane was climbing in a nose high pitch attitude and that the airplane's bank angle was approximately 50-60 degrees when the airplane's nose began to pitch down. The witness stated that the airplane's maximum nose-down pitch angle was 70-80 degrees at the time of the impact and that the airplane wings were level at the time of impact. The witness reported that the fire started approximately 1-2 seconds after the impact with the terrain.

PERSONAL INFORMATION

The pilot, born May 14, 1974, was the holder of a commercial pilot certificate with privileges for single and multiengine land airplanes. The pilot was instrument rated and was certified as an advanced ground instructor. Federal Aviation Administration (FAA) records indicate that the pilot's last aviation medical examination was preformed on January 21, 1999. The FAA records indicate that the pilot was issued a second-class medical with no limitations or restrictions.

The pilot was involved in another airplane accident, dated July 23, 1999, and had provided a National Transportation Safety Board Pilot/Operator Aircraft Accident Report, in which his current flight hours were recorded. According this report, the pilot had accumulated a total of 1,359 hours of flight time. The report stated that he had completed a Biennial Flight Review on "08/03/99" in a Beechcraft Skipper.

The pilot's personal logbook was recovered at the accident site, but was unreadable due to fire and water damage.

AIRCRAFT INFORMATION

The aircraft was a Beechcraft C23, Sundowner, serial number M-1744. The Beechcraft C23 is a single-engine, low-wing monoplane of all metal construction, equipped with a fixed landing gear, and can accommodate a pilot and three passengers. The airplane was issued a Standard Airworthiness Certificate on December 3, 1975. The airplane had logged a total-time of 3,191 hours at the time of the accident. The last annual inspection was completed on May 25, 1999 and the airplane was determined to be in an unairworthy condition due to an Airworthiness Directive (AD) on the engine oil pump not being in compliance. According to AD 96-09-10 Textron Lycoming, the purpose of the AD was, "To prevent oil pump failure due to impeller failure, which could result in an engine failure." A copy of AD 96-09-10 and the referenced Textron Lycoming Service Bulletin No. 524 are appended to this report.

During the post-accident inspection of the engine and its components the engine oil pump was disassembled. Examination of the oil pump revealed no anomalies that would preclude the normal operation of the pump and both of the oil pump's impeller gears were intact.

The engine was an Avco Lycoming O-360-A4K, serial number L-20523-36A, and at the time of accident had accumulated 1,571 hours since major overhaul.

METEOROLOGICAL INFORMATION

A weather observation located at the departure airport, reported the weather at the time of the accident as:

Observation Time: 1355 cdt Wind: 160-degrees at 5 knots
Visibility: 10 statute miles Sky Condition: Sky clear
Temperature: 31-degrees centigrade Dew Point Temperature: 17-degrees centigrade Altimeter Pressure: 29.69 inches of mercury

WRECKAGE AND IMPACT INFORMATION

An examination of the wreckage was conducted on July 30, 1999.

The aircraft impacted a cornfield that was approximately 1/4 mile east of the departure end of runway. The aircraft came to rest on a 240-degree magnetic heading and a global positioning system (GPS) unit identified the accident location as:

46-degrees 49.205-minutes North Latitude 95-degrees 52.340-minutes West Longitude

All of the wreckage was located within a 35-foot radius of the initial impact location. The aircraft was consumed by a post impact fire from the firewall to a point approximately 16-inches forward of the empennage. Aileron, stabilator, and rudder continuity were established from the remaining control surfaces to the forward-cockpit area. The flaps were found in the

fully retracted position. The cockpit and the instrument panel were consumed by fire.

No anomalies, relative to the airframe or its systems, were found that could be associated with a preexisting condition.

The engine was recovered from the accident location to a maintenance facility for examination. The engine was found with a black soot-like substance over the entire crankcase with evidence of sustained exposure to heat and fire. The ignition system, including the magnetos and harness, was compromised by fire. Engine continuity was established throughout the engine and its accessories by rotating the engine by means of the propeller. Quantitative compression readings for each of the cylinders could not be accurately determined due to impact damage. Cylinders number one and three were removed for examination of the cylinders and their pistons. No rust or contamination was found in the cylinders and pistons, and no abnormal wear signatures were noted on the components. The upper spark plugs were removed and exhibited a light gray color.

The engine accessory section and the engine-driven oil pump were removed for inspection. Examination of the oil pump revealed no anomalies that would preclude the normal operation of the pump and both of the oil pump's impeller gears were intact.

No anomalies, relative to the engine or its systems, were found that could be associated with a preexisting condition.

The propeller was found attached to the engine with visible evidence of impact damage. One propeller blade was bent aft approximately 30-degress, just outboard of the propeller flange. The propeller blade faces had evidence of chordwise scratching and burnishing.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Ramsey County Medical Examiners Office, St. Paul, Minnesota, on July 30, 1999.

A Forensic Toxicology Fatal Accident Report was prepared by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma.

The toxicology report indicated the following results:

* No Ethanol detected in Heart Fluid * No Ethanol detected in Kidney Fluid * 0.043 (ug/ml, ug/g) Tetrahydrocannabinol (Marijuana) detected in Heart Fluid * 0.012 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marijuana) detected in Heart Fluid * 0.057 (ug/ml, ug/g) Tetrahydrocannabinol (Marijuana) detected in Kidney Fluid * 0.18 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marijuana) detected in Kidney Fluid * 0.352 (ug/ml, ug/g) Tetrahydrocannabinol (Marijuana) detected in Liver * 2.969 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marijuana) detected in Liver

TESTS AND RESEARCH

The manager of the FAA Toxicology and Research Laboratory stated in a memo that, "The 99 ng/ml of THC and the 56 ng/ml of THC-COOH in blood would indicate a recent exposure to marihuana [marijuana] of less than 1.0 hour." The time duration since direct inhalation was calculated from an equation reported in the Journal of Analytical Toxicology, Volume 16 September/October 1992, on page 285.

According to the book entitled, "Fit To Fly A Pilot's Guide to Health & Safety", author Richard O. Reingart MD, the active ingredient in marijuana is, "...THC (delta 9 tetra hydrocannibinal)...." The book continues, "THC causes temporary euphoria and relaxation. However, more than alcohol, it distorts perception, weakens critical judgment, and interferes with the ability to concentrate. THC also increases heart rate and the incidence of cardiac arrhythmias. Short term memory is impaired, IQ is thought to be diminished, and there is a decrease in reaction time and tracking (similar to alcohol)."

ADDITIONAL INFORMATION

Parties to the investigation were:

Federal Aviation Administration Flight Standards District Office, Minneapolis, Minnesota.

Raytheon Aircraft Company, Wichita, Kansas.

The wreckage was released to a representative of the Detroit Lakes Police on July 30, 1999.

Pilot Information

Certificate:	Commercial	**Age:**	25,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 21, 1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1359 hours (Total, all aircraft), 1275 hours (Pilot In Command, all aircraft), 192 hours (Last 90 days, all aircraft), 68 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N6996R
Model/Series:	C23 C23	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	M-1744
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 25, 1999 Annual	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3191 Hrs	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	O-360-A4K
Registered Owner:	SID HALL ENTERPRISES, INC.	**Rated Power:**	180 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	SOUTHERN AIRCRAFT SALES	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DTL ,1396 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	13:55 Local	**Direction from Accident Site:**	299°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	31°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(DTL)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	14:20 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	DETROIT LAKES AIRPORT DTL	**Runway Surface Type:**	Asphalt
Airport Elevation:	1396 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	13	**IFR Approach:**	None
Runway Length/Width:	4500 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal	**Latitude, Longitude:**	46.810962,-95.839225(est)

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	JAN ORR; MINNEAPOLIS , MN BRIAN D CASSIDY; WICHITA , KS
Original Publish Date:	April 20, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46884