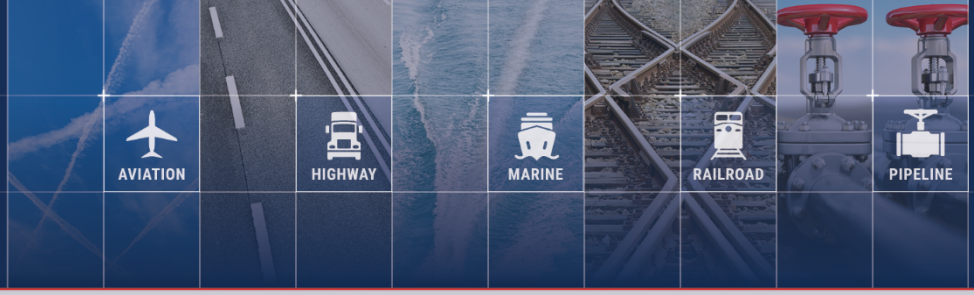

Aviation Investigation Final Report

Location:	Capron, Illinois	**Accident Number:**	CHI00FA186
Date & Time:	July 8, 2000, 18:55 Local	**Registration:**	N8739V
Aircraft:	Bellanca 8KCAB	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot attempted an aerobatic roll maneuver at an altitude lower than 100 feet above ground level and impacted the terrain at the completion of the maneuver. No anomalies with the aircraft or its engine could be associated to any pre-impact condition. According to the Bellanca 8KCAB Owner Manual, "Remember, altitude is your best insurance when doing aerobatics. According to Federal Aviation Regulations, the minimum legal altitude for aerobatics is 1500 feet AGL. Keep in mind that 1500 feet is therefore the minimum recovery altitude from any inadvertent maneuver and that 1000 feet of altitude can often be lost in a three-turn spin." 14 CFR Part 91.303, entitled "Aerobatic Flight", states that no person may operate an aircraft in aerobatic flight below an altitude below 1,500 feet above ground level. 14 CFR Part 91.303 further states, "For the purposes of this section, aerobatic flight means an intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot attempting an aerobatic maneuver at a low altitude and the pilot not maintaining clearance from the terrain. A factor to the accident was the pilot disregarding the federal aviation regulations concerning the minimum altitudes required for aerobatic operations.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings
1. (F) PROCEDURES/DIRECTIVES - DISREGARDED - PILOT IN COMMAND
2. (C) AEROBATICS - ATTEMPTED - PILOT IN COMMAND
3. (C) ALTITUDE - LOW - PILOT IN COMMAND
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On July 8, 2000, at 1855 central daylight time, a Bellanca 8KCAB, N8739V, piloted by an airline transport pilot, sustained substantial damage during an in-flight collision with the terrain while maneuvering at a low altitude near Capron, Illinois. Visual metrological conditions prevailed at the time of the accident. The personal flight was operating under the provisions of 14 CFR Part 91 and was not on a flight plan. The pilot, the sole occupant, was fatally injured. The local flight departed the pilot's private airstrip near Capron, Illinois, at exact time unknown.

According to an incident report prepared by the Boone County Sheriff Department, the aircraft's co-owner was a witness to the accident and was interviewed concerning the circumstances of the accident. The report states that the witness was inside his residence when he heard an airplane make low-pass over his property at approximately 500 feet above ground level (agl) from the south, heading northbound. The witness reported that he went outside and saw the accident airplane approach his residence from the southwest at an altitude of 40-50 feet agl. The witness stated that after the low-pass the airplane climbed to altitude of 500 feet agl. The witness reported that the airplane did another low-pass, at an altitude lower than the second pass, and finished the low-pass with a climb back to approximately 500 feet agl. The witness reported that on the fourth and final pass the airplane approached from the north and, "it [the accident airplane] barely cleared the power lines on the north side of the property along Randall Rd. and that after clearing the power lines [the pilot] pitched the nose forward slightly to increase the airspeed of the aircraft after which he pulled the nose upward to approximately a 30-40 degree pitch and gained some altitude... ." The witness reported, "[the pilot] then attempted a barrel roll to the left and after completing the maneuver the aircraft's nose was down and the right wing hit the ground causing the aircraft to nose into the ground." A copy of the Sheriff Department's incident report, including the witness interview, is attached to this factual report.

PERSONNEL INFORMATION

According to FAA records, the pilot was the holder of an airline transport pilot certificate with ratings for airplane multi-engine land and instrument airplane operations. The pilot also was the holder of a commercial pilot certificate for single-engine land airplanes and a flight engineer certificate for turbojet-powered airplanes. FAA records show the pilot's last medical examination was on April 12, 2000, and the pilot was issued a first-class medical certificate with the limitation, "Must Have Available Glasses For Near Vision".

The pilot was reported to have accumulated a total flight time of approximately 20,200 hours, of which 4,200 hours were in single engine airplanes and 16,000 hours were in multiengine

airplanes. The pilot had logged approximately 130 flight hours in the accident airplane make and model. The pilot was reported to have flown 269 hours in the last 90 days, of which 25 hours were in the accident airplane. The pilot was reported to have flown 89 hours in the last 30 days, of which 8 hours were in the accident airplane. The pilot was reported to have flown 1 hour during the last 24 hours.

AIRCRAFT INFORMATION

The aircraft was a Bellanca 8KCAB, N8739V, serial number 198-75. The Bellanca 8KCAB is a production built, dual strutted high-wing airplane consisting of a fabric covered steel-tube fuselage and a fabric covered wing. The Bellanca 8KCAB has a fixed landing gear and can accommodate a pilot and a single passenger in a tandem seating arrangement. The FAA issued the airplane a Standard Airworthiness Certificate on July 17, 1975, and the airplane was certificated for both normal and acrobatic categories. The airplane had accumulated a total-time of 1,076.00 hours at the time of the accident. The last annual inspection was completed on February 25, 2000, at 1,037.50 hours. According to the aircraft maintenance logbooks, all applicable FAA Airworthiness Directives were complied with at the completion of the last annual inspection.

The engine was a 150-horsepower Lycoming AEIO-320-E1B, serial number L-5329-55A, and at the time of the accident had accumulated 1,076.00 total hours since new. The engine had accumulated 242.30 hours since the last major overhaul.

The propeller was a Hartzell HC-C2YL-4, serial number DW201, and at the time of the accident had accumulated 1,076.00 hours since new.

METEOROLOGICAL INFORMATION

A weather observation station, located at the Greater Rockford Airport (RFD), 22 nautical miles southwest of the accident site, reported the weather 1 minute before the accident as:

Observation Time:	1854 cdt
Wind:	170-degrees at 8 knots
Visibility:	6 statute miles with haze
Sky Condition:	3,800 feet agl Scattered, 4,700 feet agl Broken
Temperature:	28-degrees centigrade
Dew Point:	24-degrees centigrade
Pressure:	30.02 inches of mercury

WRECKAGE AND IMPACT INFORMATION

An examination of the wreckage was conducted on July 9, 2000.

The airplane impacted a soybean field adjacent to a house located at 10799 Randall Road in

the town of Capron, Illinois. All components of the aircraft were accounted for at the accident site.

Flight control cable continuity for the entire right aileron control circuit was established. The aileron balance cable was fragmented and exhibited signatures consistent with tensile overload failure. Control cable continuity for the left aileron could not be established because of impact damage and fragmentation that exhibited signatures consistent with tensile overload failure. Examination of the aileron control system and its associated components did not reveal any evidence of any pre-impact jam or failure.

Flight control cable continuity for the elevator system was established from elevator to the cockpit control stick. The control cable circuitry for the elevator trim was established from the trim surface to the cockpit. Examination of the elevator system and its associated components did not reveal any evidence of any pre-impact jam or failure.

Flight control cable continuity for the rudder was established from the rudder to the cockpit rudder pedals. Examination of the rudder control cable circuit its and associated components did not reveal any evidence of any pre-impact jam or failure.

Both main fuel tanks, located in the wings, were ruptured. A header-tank was installed and a fluid, blue in color and consistent with 100 low-lead aviation fuel, was found in an outflow fuel-line that traveled from the tank forward through the firewall.

No anomalies, relative to the airframe or its systems, were found that could be associated to any pre-impact condition.

Engine continuity was established throughout the engine and its accessories by rotating the engine at the propeller flange. The left magneto was damaged and no spark was generated when the engine was rotated at the propeller flange. The right magneto was removed and it provided spark on all leads when rotated by hand. A fluid, blue in color and consistent with 100 low-lead aviation fuel, was found in the flow divider that provides fuel to the fuel injectors. The upper spark plug leads were removed and their electrodes were light gray in color. The propeller blades had S-shape bending, leading edge gouges, and chordwise scratching.

No anomalies, relative to the engine or its accessories, were found that could be associated to any pre-impact condition.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Boone County Coroner Facility, Belvidere, Illinois, on July 11, 2000.

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

The toxicology results for the pilot were:

* No Carbon Monoxide detected in Blood
* No Cyanide detected in Blood
* No Ethanol detected in Vitreous
* No Ethanol detected in Blood
* 13 (mg/dL, mg/hg) Ethanol detected in Brain
* 5 (mg/dL, mg/hg) Acetaldehyde detected in Brain

The toxicology report stated, "The ethanol found in this case is from postmortem ethanol formation and not from the ingestion of ethanol."

TESTS AND RESEARCH

According to the Bellanca 8KCAB Owner Manual, "Remember, altitude is your best insurance when doing aerobatics. According to Federal Aviation Regulations, the minimum legal altitude for aerobatics is 1500 feet AGL. Keep in mind that 1500 feet is therefore the minimum recovery altitude from any inadvertent maneuver and that 1000 feet of altitude can often be lost in a three-turn spin."

14 CFR Part 91.303, entitled "Aerobatic Flight", states:

"No person may operate an aircraft in aerobatic flight -
(a) Over any congested area of a city, town, or settlement;
(b) Over an open air assembly of persons;
(c) Within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport;
(d) Within 4 nautical miles of the center line of any Federal airway;
(e) Below an altitude of 1,500 feet above the surface; or
(f) When flight visibility is less than 3 statute miles."

14 CFR Part 91.303 further states, "For the purposes of this section, aerobatic flight means an intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration, not necessary for normal flight."

ADDITIONAL INFORMATION

A party to the investigation was the Federal Aviation Administration.

The wreckage was released to a representative of the Boone County Sheriff Department on July 9, 2000.

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer	**Age:**	45,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 12, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	20200 hours (Total, all aircraft), 130 hours (Total, this make and model), 269 hours (Last 90 days, all aircraft), 89 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N8739V
Model/Series:	8KCAB 8KCAB	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Normal	**Serial Number:**	198-75
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	February 25, 2000 Annual	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:	38.5 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1076 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	AEIO-320-E1B
Registered Owner:	Owl Aviation Services, INC.	**Rated Power:**	150 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	RFD,742 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	18:54 Local	**Direction from Accident Site:**	225°
Lowest Cloud Condition:	Scattered / 3800 ft AGL	**Visibility**	6 miles
Lowest Ceiling:	Broken / 4700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	28°C / 24°C
Precipitation and Obscuration:	N/A - None - Haze		
Departure Point:	Capron, IL (PVT)	**Type of Flight Plan Filed:**	None
Destination:	Capron, IL (PVT)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	42.389045,-88.739578(est)

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Barb O Snowden; Federal Aviation Administration; West Chicago, IL
Original Publish Date:	February 5, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49635