Aviation Investigation Final Report

Location:	Henderson, Kentucky	**Accident Number:**	ERA19FA155
Date & Time:	April 22, 2019, 22:03 Local	**Registration:**	N9693E
Aircraft:	Bellanca 1730	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The student pilot and passenger had taken the airplane without permission from the owner on a night cross-country flight with an unknown destination. About 4 hours after departure, the airplane flew an approach to a closed airport but likely did not land. The airplane then climbed and flew about 10 miles away from the airport before returning; the last radar data indicated an altitude of about 700 ft above the ground about 1/2 mile south of the runway consistent with aa left downwind leg in the airport traffic pattern. The airplane impacted terrain in a near vertical nose-down attitude near midfield about 200 ft south of the runway. There were no ground scars leading up to the main wreckage, which was consistent with little or no forward airspeed and a loss of control. About 3-4 gallons of fuel were recovered from the right wing; however, a placard on the filler neck indicated 4 gallons of fuel were unusable. A trace amount of fuel was found in the left wing, and no fuel was found in the fuselage auxiliary tank. A post-accident examination of the airframe and engine revealed no preimpact anomalies that would have precluded normal operation; however, a lack of rotational scoring on the propeller blades was noted. It is likely that the airplane's engine lost power due to fuel exhaustion as the airplane was in the airport traffic pattern the second time, and the pilot failed to maintain sufficient airspeed, which resulted in an aerodynamic stall and impact with terrain.

The student pilot had logged 24 hours of total flight experience, 23 of which was dual instruction. He had logged 3 hours of dual cross-country experience, of which 1.4 hours were in the accident airplane earlier on the day of the accident. He had no other experience in an airplane of the same make/model. He had logged a total of 4 hours at night in a different airplane make/model. Thus, it is likely that the pilot had little experience in fuel planning and management, night operations, and emergency procedures in the accident airplane make/model to help him deal with the loss of engine power on approach to the airport at night.

Toxicology performed on the student pilot was positive for methamphetamine, cocaine, and their metabolites. Although the test results could not be directly correlated to the exact time of use, the amount, or the residual effects at the time of the accident, the results suggest use within hours of the accident. It is likely that impairment from the student pilot's use of cocaine and methamphetamine

contributed to his unsafe decision-making to embark on the night cross- county flight in an unfamiliar and complex airplane, with a passenger, on the night of the accident.

Probable Cause and Findings

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

The student pilot's failure to maintain proper airspeed, which resulted in the exceedance of the airplane's critical angle of attack at a low altitude, in the airport traffic pattern, following a total loss of engine power due to fuel exhaustion. Contributing to the accident was the student pilot's decision to attempt the night cross-country flight, his lack of overall and specific operational experience, and his likely impairment from use of methamphetamine and cocaine.

Findings

Personnel issues	Aircraft control - Student/instructed pilot
Aircraft	Angle of attack - Not attained/maintained
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Fuel planning - Pilot
Aircraft	Fuel - Fluid level
Personnel issues	Decision making/judgment - Student/instructed pilot
Environmental issues	Dark - Decision related to condition
Personnel issues	Total experience - Student/instructed pilot
Personnel issues	Total experience w/ equipment - Student/instructed pilot
Personnel issues	Illicit drug - Student/instructed pilot

Factual Information

History of Flight

Approach	Fuel exhaustion (Defining event)
Approach	Loss of control in flight
Approach	Collision with terr/obj (non-CFIT)

On April 23, 2019, at 2203 central daylight time, a Bellanca 17-30A, N9693E, was substantially damaged when it was involved in an accident in Henderson, Kentucky. The student pilot and passenger were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

According to the airplane owner, the airplane was for sale and the student pilot was interested in purchasing it and had flown the airplane earlier in the day with a flight instructor. According to the student pilot's logbook, that flight was from Mid-Carolina Regional Airport (RUQ), Salisbury, North Carolina, to Spartanburg Memorial Airport (SPA), Spartanburg, South Carolina, and back to RUQ. The flight time was logged as 1.4 hours. Fuel records indicated the airplane was fueled at RUQ twice on day of the accident. The first was at 1124 eastern daylight time with 16 gallons. The second was at 1846 eastern daylight time with 52 gallons.

According to the airport manager at RUQ, a video recording showed the airplane depart RUQ at 1905 eastern daylight time, which was about 1 hour before sunset. The owner reported that the student pilot flew the airplane on the accident flight without his permission. A review of Federal Aviation Administration (FAA) radar data revealed a track consistent with the accident airplane approaching Henderson City-County Airport (EHR), Henderson, Kentucky, from the southeast about 2145. The airplane flew a 270° left turn around the airport to a left downwind traffic pattern leg for runway 27. At 2151, the airplane was on a 1/2-mile final at an altitude of about 700 ft mean sea level (msl) when radar contact was lost. About 1.5 minutes later, the airplane appeared on radar about 1.1 miles west of the departure end of the runway at 700 ft msl. The radar track depicted the airplane flying north-northwest about 10 miles to an area where weather radar data depicted light rain. The airplane then reversed course back toward the airport. At 2203, the last recorded data indicated the airplane was about 1/2 mile south of and abeam the departure end of runway 27, on a track of about 105° magnetic at an altitude of 1,050 ft msl and a groundspeed of 90-100 knots. The field elevation was 387 ft msl.

Airport personnel at EHR discovered the airplane shortly before 0700 the following day as they prepared to open the airport. The airplane was in a grass area about midfield, 200 ft left of the runway 27 centerline, about 0.85 mile from the last recorded radar position. The airport had closed the previous evening at 1930. When closed, the pilot-controllable runway lighting remained activated on its "low" setting, and the airport rotating beacon remained on from sunset to sunrise.

No eyewitnesses were identified; however, the state police received several calls the following day from witnesses who reported hearing either a low flying airplane or a "boom" sound at times between 2000 and 2230 on April 23, 2019.

Student pilot Information

Certificate:	Student	**Age:**	48,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	February 9, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	24 hours (Total, all aircraft), 1 hours (Total, this make and model), 1 hours (Last 24 hours, all aircraft)		

The pilot's logbook did not contain any endorsements for solo flight or for operation of complex/high performance airplanes. There were 2 entries for dual cross-country flights: one night flight on February 9, 2018, for 1.6 hours in a Cessna 172, and the earlier daylight flight on the accident day. The only other night experience logged was 2.4 hours of dual instruction, annotated as takeoff and landings in a Cessna 172.

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N9693E
Model/Series:	1730	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	76-30840
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	3325 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2310 Hrs at time of accident	**Engine Manufacturer:**	Continental Motors
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-520-K1A
Registered Owner:		**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The pilot's operating handbook for the accident airplane was not found. According to the handbook for a similar airplane, the fuel burn rate in cruise flight is about 13 to 16 gallons per hour. The fuel tanks hold 68 gallons of fuel of which 60 gallons is usable.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	EHR,387 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	21:56 Local	**Direction from Accident Site:**	171°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	18°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Salisbury, NC (RUQ)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Weather radar records depicted light rain about 10 miles north-northwest of the airport. The sun had set at 1934, about 2.5 hours before the accident. The moon had not risen.

Airport Information

Airport:	HENDERSON CITY-COUNTY EHR	**Runway Surface Type:**	Grass/turf
Airport Elevation:	386 ft msl	**Runway Surface Condition:**	Wet
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	37.80722,-87.684448

Examination of the wreckage revealed that all major components of the airplane were present at the

accident site and were confined to an area approximately 100 ft in diameter. The right wing leading edge was fragmented and separated from the wing and found within a ground scar in the grass oriented about 270° magnetic. The propeller hub was separated from the engine with all three blades attached and embedded in the mud; the hub was oriented about 90° nose-down near the inboard section of the right wing leading edge. The spinner was crushed aft. One blade was bent aft about midspan, one was bent slightly aft about 1/3 span, and the third blade was not bent. None of the blades had any chordwise scratch marks. The fuselage came to rest about 15 ft south of the right wing leading edge fragments and was oriented perpendicular to the runway. There were no ground scars leading toward or away from the main wreckage area. The right wing was fractured about midspan with the outboard section partially separated. The two aluminum fuel tank cells in the right wing were damaged but largely intact. Blue stains were found on the wood wing components below and forward of the fuel tanks, surrounding the tank vent, and on the fuel quantity sensor. About 3 to 4 gallons of fuel were recovered from the right wing tanks. A placard on the tank filler neck read "34 GAL. 30 GAL. USABLE."

The fuel selector valve was found in the "RIGHT" tank position.

The left wing was largely intact. The fuel tanks were not damaged. About 2 ounces of fuel were recovered after pressurizing the tanks with air at the filler neck. The forward fuselage exhibited crush damage and was partially separated at the leading edge of the wing. The auxiliary fuel tank located behind the rear seats was undamaged and was devoid of fuel.

Flight control continuity was established from all primary flight control surfaces to their respective cockpit controls. Pitch trim control continuity was established from the trim tab to the damaged roof area of the cockpit. The empennage was mostly undamaged. The landing gear handle was in the "down" position and both main landing gear were extended. The nose landing gear was damaged and partially extended. There was no evidence of a postcrash fire.

All four engine mounts were fractured, and the engine was separated from the fuselage. The oil sump was impact damaged and breached near the drain plug, and an undetermined amount of oil was found underneath the engine. The top spark plugs were removed and the Nos. 1 through 4 plugs exhibited light grey colored combustion deposits; the Nos. 5 and 6 plugs exhibited darker black colored combustion deposits. All electrodes exhibited normal wear signatures when compared to the Champion Check-A-Plug chart. The fuel pump remained attached to the engine; the drive coupling was intact, and a few drops of fuel leaked from the fractured pump inlet fitting when the pump was removed from the engine. After priming, the fuel pump operated normally when turned. The fuel nozzles were removed and were free of obstruction. The engine crankshaft was rotated by hand at the propeller flange using a leverage tool. Thumb compression and suction was observed on all six cylinders with proper valve movement established. Continuity throughout the engine and accessory section was established. Both magnetos were found separated from their mounting pads with their mounting flanges fractured. Both produced impulse coupling engagement and spark on all towers when rotated by hand. The fuel manifold valve was disassembled; the diaphragm was intact with no indication of leakage, the plunger and retaining nut were tight and secure, the fuel screen was clean, and the cavity contained a small amount of fuel. The air induction tubes were crush damaged. The air filter was not found. The throttle body and mixture control assembly were separated from the engine and remained near the firewall with the throttle and mixture control cables attached to their respective control arms.

Additional Information

Based on the estimated fuel onboard and the estimated fuel burn rate, the airplane's estimated endurance was about 4 hours or more (assuming no fuel in the auxiliary tank). Based on the departure time and radar data before the accident the flight was about 4 hours long, including about 20 minutes of flight after the initial approach at EHR, even though a direct flight would be about 2.4 hours at a cruise speed of 180 mph. The investigation could not determine the precise route of the entire flight, or, if there were any intermediate stops.

Medical and Pathological Information

An autopsy of the pilot was performed by the Western Kentucky Regional Medical Examiner's Office, Madisonville, Kentucky. The cause of death was multiple blunt force trauma.

Toxicology testing performed on specimens from the pilot by the FAA Forensic Sciences Laboratory identified 173 ng/ml of methamphetamine in femoral blood and 26,859 ng/ml in urine; 28 ng/ml of its primary metabolite, amphetamine, in femoral blood and 3,073 ng/ml in urine; cocaine in femoral blood (unquantified) and its metabolites, benzoylecgonine (200 ng/ml) and ecgonine methyl ester, in femoral blood and urine (benzoylecgonine at 12,795 ng/ml); levamisole, an animal antiparasitic often used to cut street cocaine, in cavity blood and urine; and tetrahydrozoline (the active ingredient in Visine and other ophthalmologic products), phenylpropanolamine
(a sympathomimetic no longer available for use in humans in the US but often a contaminant in street methamphetamine), and another metabolite of cocaine, anhydroecgonine methyl ester in urine.

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass		
Additional Participating Persons:	Silvestro Mumfrey; FAA/FSDO; Louisville, KY Christopher Lang; Continental Aerospace; Mobile, AL		
Original Publish Date:	December 3, 2020	**Investigation Class:**	2
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99304		

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