Aviation Investigation Final Report

Location:	Middleburg, Florida	**Accident Number:**	ERA21FA194
Date & Time:	April 28, 2021, 09:00 Local	**Registration:**	N6009U
Aircraft:	Beech C23	**Aircraft Damage:**	Destroyed
Defining Event:	Collision with terr/obj (non-CFIT)	**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot and two passengers were departing from a grass runway. The grass was several inches high and the ground was soft. There were no eyewitnesses to the accident; however, examination of wheel impressions left in the soft soil of the runway revealed that the airplane became airborne about 2,300 ft down the 3,700-ft-long runway and impacted 70- to 80-ft-tall trees about 800 ft past the runway end.

Examination of the wreckage revealed no evidence of mechanical malfunctions with the airframe or engine that would have precluded normal operation. A witness who arrived at the accident site about 30 minutes after the accident, and a nearby weather observation around the time of the accident, indicated that the pilot likely departed with a tailwind. Review of the airplane's takeoff performance chart indicated that, on a grass runway, the airplane's predicted ground roll would be about 1,285 ft and about 2,151 ft was required to clear a 50-ft obstacle; however, the chart was based on the runway being dry, the grass short, and no wind. Based on the available information, it is likely that the pilot failed to account for the decreased takeoff performance due to the runway condition and the tailwind, which both would have increased required takeoff distance.

Toxicology testing of specimens from the pilot detected the non-impairing local anesthetic medication lidocaine and the high blood pressure medication valsartan in blood and urine. It is unlikely that the pilot's medical conditions or medications were factors in the accident. Toxicology testing of specimens from the pilot-rated passenger revealed the anti-anxiety medication alprazolam at 8 ng/mL in heart blood and in liver tissue. The antidepressant sertraline and its metabolite desmethylsertraline were detected in heart blood and liver tissue. The over-the-counter motion sickness medication meclizine was detected in liver. While it is unknown how well these conditions were controlled or if the pilot-rated passenger experienced any impairing side effects, the effects from the use of these medications would not have

influenced the outcome of the takeoff, and it is unlikely that his anxiety or depression or the effects from his use of medication contributed to the accident.

Probable Cause and Findings

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

The pilot's decision to depart from a soft grass runway with a tailwind, which resulted in an increased takeoff distance and subsequent impact with trees during the initial climb.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Tailwind - Decision related to condition
Environmental issues	Soft surface - Effect on equipment
Aircraft	Takeoff distance - Not attained/maintained

Factual Information

History of Flight

Takeoff	Collision with terr/obj (non-CFIT) (Defining event)

On April 28, 2021, about 0900 eastern daylight time, a Beech C-23, N6009U, was destroyed when it was involved in an accident near Middleburg, Florida. The pilot, pilot-rated passenger, and second passenger were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

A witness described that, around 0840, he heard what he thought was the accident airplane departing from Spencer's Airpark (FL13), Middleburg, Florida. Shortly thereafter, he heard the sirens of first responders as they proceeded toward the accident site.

Pilot Information

Certificate:	Private	**Age:**	77,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed With waivers/limitations	**Last FAA Medical Exam:**	September 5, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	435 hours (Total, all aircraft)		

Pilot Information

Certificate:	Private	**Age:**	78,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed With waivers/limitations	**Last FAA Medical Exam:**	September 5, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	840 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N6009U
Model/Series:	C23	**Aircraft Category:**	Airplane
Year of Manufacture:	1978	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	M-2088
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	LYCOMING
ELT:	Installed	**Engine Model/Series:**	O&VO-360 SER
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HEG,87 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	09:15 Local	**Direction from Accident Site:**	34°
Lowest Cloud Condition:	Clear	**Visibility**	5 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.16 inches Hg	**Temperature/Dew Point:**	23°C / 18°C
Precipitation and Obscuration:	Moderate - None - Haze		
Departure Point:	Middleburg, FL	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

The 0915 recorded weather observation at Herlong Airport (HEG), Jacksonville, Florida, located about 16 miles northeast of the accident location, included wind from 140° at 7 knots, visibility 5 miles, clear of clouds, and temperature 23°C, dew point 18°C, and an altimeter setting of 30.16 inches of mercury. A witness who arrived at the airport about 30 minutes after the

accident stated that, at that time, the wind was coming from the east (tailwind for runway 27) at an estimated velocity of 15 knots.

A witness who arrived at the airport about 30 minutes after the accident stated that, at that time, the wind was coming from the east (tailwind for runway 27) at an estimated velocity of 15 knots.

Airport Information

Airport:	Spencers Airpark FL13	**Runway Surface Type:**	Grass/turf
Airport Elevation:	150 ft msl	**Runway Surface Condition:**	Soft
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	3700 ft / 75 ft	**VFR Approach/Landing:**	None

The airport was located at an elevation of 150 ft mean sea level (msl), and its single turf runway was 3,800 ft long by 75 ft wide and oriented in a 9/27 configuration. Runway 27 sloped downward with an elevation change between the runway ends of about 40 ft. Trees that were an estimated 70 to 80 ft tall were present beyond the departure end of runway 27.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	30.062274,-81.974963(est)

The accident site was located in a heavily wooded area about 800 ft beyond the departure end of runway 27. Multiple tree branches that displayed angular cuts were found along a path that extended from the trees near the departure end of the runway to the wreckage.

The fuselage came to rest upright oriented on a heading of 180° magnetic. The airplane was partially consumed by a postaccident fire. The engine remained attached to the firewall through the tubular engine mount and was heavily fire damaged. The propeller remained attached to the engine crankshaft flange. The spinner dome and one propeller blade were

embedded in the soft earth. The engine oil sump, carburetor, and the lower portion of the accessory case were consumed in the post-impact fire. The engine-driven fuel pump, vacuum pump, and both magnetos were heavily fire damaged. The cabin and instrument panel were also consumed by the postimpact fire. The wings sustained tree impact damage and were partially separated from the fuselage. Both wings came to rest in front of the engine and sustained significant postimpact fire damage. The right flap was separated from the wing and remained in one piece. A small fragment of the left flap was found forward of the engine. The empennage sustained minimal impact damage; however, it was thermally damaged. Flight control cable continuity was established to the rudder and stabilator. Aileron and flap continuity were partially established due to multiple separations that displayed signatures consistent with overload separation and postimpact fire damage. The manual flap handle ratchet plate was loose; and the position of the flaps at the time of the accident could not be determined. The stabilator trim was found in a position that correlated to about 8° tab trailing edge down.

Examination of the runway surface revealed that the turf had not been recently mowed and was several inches high. The soil was soft. There were 1.5-inch-deep wheel impression marks from the airplane leading from the pilot's hangar to the takeoff point on the runway. The tire impressions measured about 2,300 ft from the approach end of runway 27 to the takeoff point. The distance from the takeoff point to the trees was about 1,300 ft.

Medical and Pathological Information

Toxicology testing was performed by the Federal Aviation Administration Forensic Sciences Laboratory on the pilot and pilot-rated passenger. Testing of specimens from the pilot detected the non-impairing local anesthetic medication lidocaine and the high blood pressure medication valsartan in blood and urine; carboxyhemoglobin was reported as not detected in iliac blood. The Office of the Medical Examiner detected carboxyhemoglobin at 15% in iliac blood; testing was negative for ethanol and drugs.

Specimens from the pilot-rated passenger revealed the anti-anxiety medication alprazolam at 8 ng/mL in heart blood and liver tissue. The antidepressant sertraline and its metabolite desmethylsertraline were detected in the heart blood at 260 ng/mL and 582 ng/mL, respectively; both were also detected in lever tissue. The over-the-counter motion sickness medication meclizine was detected in liver.

Additional Information

Per the Beechcraft C23 Sundowner Pilot's Operating Handbook (POH), the aircraft takeoff speeds for safe operation are 65 knots at "lift-off," and 74 knots at "50 ft." The "Take-off Distance – Grass Surface" performance chart was interpolated for the associated conditions of 19°C and field elevation of 150 ft msl. The estimated ground roll with no wind was 1,285 ft and the distance to clear a 50-ft obstacle was 2,151 ft. The takeoff distance performance chart did not include information for calculating the adverse impact of tailwind conditions or a soft runway surface.

The FAA Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B), states: *The effect of wind on takeoff distance is large, and proper consideration must also be provided when predicting takeoff distance… A tailwind that is 10% of takeoff airspeed increases the takeoff distance approximately 21 percent.*

Administrative Information

Investigator In Charge (IIC):	Boggs, Daniel
Additional Participating Persons:	Michael Tremblay; FAA; Orlando, FL Mike Childers; Lycoming ; Atlanta, GA Peter Basile; Textron Aviation; Wichita, KS
Original Publish Date:	February 24, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=102989