Aviation Investigation Final Report

Location:	Rotan, Texas	**Accident Number:**	CEN18FA227
Date & Time:	June 15, 2018, 15:38 Local	**Registration:**	N734BS
Aircraft:	Cessna 172N	**Aircraft Damage:**	Destroyed
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The airplane had completed an aerial photography mission with a pilot and passenger aboard and was en route to the destination airport. Video and photographic evidence obtained from two devices located in the wreckage (a Garmin Aera 560 portable GPS device and a GoPro Hero 4 action camera) and an online social media post indicated that the pilot was operating the airplane at high speeds and low altitudes during the accident flight. Photographs taken from within the airplane showed the canyon, wooden poles, and suspended power lines that the airplane eventually struck. In the final image retrieved from the GoPro camera, the airplane was in a moderate left bank at a similar altitude as the surrounding canyon and power lines and was heading toward the power lines. Given the image timestamp, the recorded time of the final GPS point, and the relative distance from the final GPS location and the accident site, it is likely that the final image from the GoPro camera depicted the canyon and wires that were struck. The airplane then impacted terrain and came to rest in a canyon about 900 ft from the location where the power lines crossed the canyon. A large portion of power line cable was found wrapped around the engine's crankshaft about 15 times, indicating that the engine was operating at considerable power output when the impact occurred.

Toxicological testing showed the presence of tetrahydrocannabinol (THC), the primary psychoactive compound in marijuana, as well as the inactive metabolites of cocaine in the pilot's blood and urine specimens. No active cocaine was found in the pilot's blood specimens, so it is unlikely that the pilot was impaired by cocaine. Although the pilot likely had a low level of active THC in his system, it is unlikely that impairment from this low level of THC contributed to the circumstances of this accident. Thus, the available evidence indicated that the pilot intentionally conducted low-level flight through a canyon without recognizing that power lines crossed the canyon, which led to the airplane's impact with power lines and subsequent impact with terrain.

Probable Cause and Findings

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

The pilot's reckless decision to conduct low-level flight over a canyon, resulting in the airplane's impact with power lines and terrain.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Wire - Effect on operation
Environmental issues	Wire - Awareness of condition

Factual Information

History of Flight

Maneuvering	Controlled flight into terr/obj (CFIT) (Defining event)

On June 15, 2018, at 1538 central daylight time, a Cessna 172N airplane, N734BS, was destroyed when it impacted power lines and terrain near Rotan, Texas. The pilot and passenger were fatally injured. The airplane was registered to and operated by Aero Photo as a Title 14 *Code of Federal Regulations* (CFR) Part 91 aerial photography flight. Visual meteorological conditions existed at the time of the accident. No flight plan was filed. The flight originated from Midland Airpark (MDD), Midland, Texas, about 1331 and was destined for Spicewood Airport (88R), Spicewood, Texas.

According to information from the operator and data from a Garmin Aera 560 portable GPS device recovered at the accident site, the airplane departed 88R about 1020 to perform aerial photography missions. After completing several missions, the airplane landed at MDD about 1250. The airplane remained at the airport for about 40 minutes and departed about 1331. The airplane flew circling-type maneuvers near Midland, Odessa, and Lubbock, Texas, consistent with the reported photography missions. After the circling maneuver near Lubbock, the airplane traveled southeast on a straight path toward 88R, but the airplane impacted non-electrified power lines that crossed a canyon and subsequently impacted terrain.

The final recorded data point, at 1537, was about 3.3 nautical miles northwest of the accident site and showed the airplane's altitude at that time as 2,206 ft mean sea level (msl). According to Google Earth, the terrain elevation at that location was about 2,008 ft msl.

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	April 18, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	5524 hours (Total, all aircraft), 5027 hours (Total, this make and model)		

The 38-year-old pilot held a commercial pilot certificate with airplane single-engine land, airplane multiengine land, and instrument airplane ratings. The pilot also held a second-class medical certificate dated April 18, 2018, without limitations. He reported 5,578 hours of total

flight experience at that time. The pilot's flight logbook was not recovered during the investigation, but he completed a company pilot information form on May 7, 2018, which indicated that he had accumulated 5,523.6 hours of total flight experience, including 2.5 hours in multiengine airplanes, 5,026.9 hours in Cessna 172 airplanes, 902.4 hours during the preceding 12 months, and 242.3 hours during the preceding 90 days. The form also indicated that the pilot's most recent flight review was conducted on February 27, 2018.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N734BS
Model/Series:	172N N	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17268731
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	August 31, 2017 Annual	**Certified Max Gross Wt.:**	2299 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	7636 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed	**Engine Model/Series:**	O-320-D2J
Registered Owner:		**Rated Power:**	160 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

The airplane, serial number 17268731, was manufactured in 1977 and was powered by a Lycoming O-320-D2J engine, serial number RL-18668-39, rated to produce 160 horsepower. The airplane had fixed landing gear and accommodated four occupants, including the pilot.

Maintenance records indicated that the airplane's most recent annual inspection was completed on August 31, 2017, with a tachometer reading of 7,636 hours. The recent airplane maintenance entries did not indicate if the tachometer reading correlated to the airplane's total time in service. Likewise, the recent engine maintenance entries did not indicate if the tachometer reading correlated to the actual engine hours or the number of hours that the engine had accumulated since its most recent overhaul.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SWW,2380 ft msl	**Distance from Accident Site:**	30 Nautical Miles
Observation Time:	20:35 Local	**Direction from Accident Site:**	170°
Lowest Cloud Condition:	Scattered / 7000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 23 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	34°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Midland, TX (MDD)	**Type of Flight Plan Filed:**	None
Destination:	Spicewood, TX (88R)	**Type of Clearance:**	None
Departure Time:	13:31 Local	**Type of Airspace:**	Class G

At 1535, the recorded weather conditions at Avenger Field Airport, Sweetwater, Texas, which was about 30 nautical miles south of the accident site, were wind from 140° at 12 knots, gusting to 23 knots; 10 statute miles visibility; scattered clouds at 7,000 ft above the ground; temperature 34°C; dew point 13°C; and altimeter setting 29.91 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	32.911945,-100.540832

The power lines that the airplane struck were suspended from wooden poles that were about 20 ft tall and were on the peaks of the ridges forming the canyon. The power lines were estimated to be about 130 ft above the floor of the canyon. The airplane came to rest inverted about 900 ft from the power lines, and the accident site was about 50° from where the power lines crossed the center of the canyon. Te power lines were not marked.

The aft fuselage was broken near the baggage compartment, and the entire aft fuselage and the tail were bent over the inverted fuselage. Both wings appeared intact and still attached to the fuselage and wing struts. The ailerons and flaps remained attached to the wings. The tail surfaces were intact, and the rudder and elevator remained attached. The engine was separated from the airplane with the propeller

still attached to the engine. A large portion of power line cable had wrapped around the crankshaft an estimated 15 times aft of the propeller. Access to the accident site was limited due to the topography, and the position of the wreckage was not suitable for a detailed on-scene examination, but subsequent examination of the airplane revealed no anomalies that would have precluded normal operation.

Additional Information

FAA regulations (14 CFR 91.13) prohibit the operation of "an aircraft in a careless or reckless manner so as to endanger the life or property of another." Furthermore, except when necessary for takeoff or landing, the regulations (14 CFR 91.119) require pilots to maintain an altitude of at least 1,000 ft above the highest obstacle within a 2,000-foot horizontal radius of the aircraft in congested areas except during takeoff or landing. In uncongested areas, pilots must maintain an altitude of at least 500 ft above the surface, except over open water or sparsely populated areas. In those cases, an aircraft cannot be operated closer than 500 ft to any person, vessel, vehicle, or structure.

An Instagram user provided the NTSB with screen-captured video recordings that were reportedly made by the passenger in the accident airplane and uploaded to Instagram's "My Story" feature. One of the passenger's videos, titled "Just Checking the Livestock" was taken from the right window of the airplane, panning forward to the windscreen. The airplane's estimated altitude at that time was 30 ft above the ground. The final "My Story" video was taken from the right window of the airplane. At that time, the airplane was traveling at a high ground speed, and the airplane's altitude was estimated to be less than 100 ft above the ground. The geography in the area consisted of small hills and rock formations.

Medical and Pathological Information

According to the autopsy performed by South Plains Forensic Pathology in Lubbock, the pilot's cause of death was blunt injuries of the head and torso.

Toxicology testing performed by the Federal Aviation Administration's (FAA) Forensic Sciences Laboratory identified, in the pilot specimens, delta-9-tetrahydrocannabinol (THC, the primary psychoactive compound in marijuana) and its metabolites as well as cocaine and its metabolites. Specifically, THC was found at 0.006 µg/ml in the pilot's cavity blood specimens as were two THC inactive metabolites, 11-nor-9-carboxy-delta-9-tetrahydrocannabinol and 11-hydroxy-delta-9-tetrahydrocannabinol. All three compounds were also found in the pilot's urine specimens. Cocaine was detected in the pilot's urine specimens as were its inactive metabolites benzoylecgonine, anhydroecgonine methyl ester, and ecgonine methyl ester. These inactive metabolites were also identified in the pilot's cavity blood specimens; cocaine was not detected in those specimens.

Tests and Research

In addition to the Garmin Aera 560 portable GPS device, a GoPro Hero 4 action camera was located at the accident site and was sent to the National Transportation Safety Board's (NTSB) Vehicle Recorder Laboratory for data extraction. The device contained 181 files consisting of 177 still images and 4 videos. Seven of the still images had timestamps consistent with the accident flight, and all those images were taken from the front right seat of the airplane. Several of those images showed the airplane operating at low altitudes near geographical features such as canyons and plateaus. The final image had a timestamp of 1540:50. For that image, the camera was pointed directly ahead of the airplane through the front windscreen, and the airplane was flying toward an area of small canyons that were depicted in previous images. The airplane was in a moderate left bank about level with the tops of small canyons that surrounded the airplane. In the distance, on top of a small canyon to the right, a wooden pole structure was visible, and the orientation of the structure indicated that the suspended power lines stretched in front of the airplane's flightpath. On the left side of the image, the suspended power lines were visible at a similar altitude as that of the airplane.

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Dawna Gournic; FAA - LBB FSDO; Lubbock, TX Peter Basile; Textron Aviation; Wicjita, KS John Butler; Lycoming; Williamsport, PA
Original Publish Date:	April 13, 2020
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97489