



Aviation Investigation Final Report

Location:	Timmonsville, South Carolina	Accident Number:	ERA17FA164
Date & Time:	April 21, 2017, 16:32 Local	Registration:	N865Z
Aircraft:	BELL-CARSON 47G SUPER C 4	Aircraft Damage:	Destroyed
Defining Event:	Controlled flight into terr/obj (CFIT)	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

On the afternoon of the accident, the pilot was scheduled to participate in a fundraising event in which he would drop golf balls from his helicopter. The pilot departed his home airport and flew to a private uncharted airfield with a turf runway, which was about halfway between the departure airport and the fundraising event location but not directly between the departure and destination locations. Radar data for the flight ended when the helicopter was about 800 ft north of the accident site and proceeding along a northwest track away from the accident site. The amount of flight time and the track after the radar data ended could not be determined. A witness reported hearing the engine as the helicopter approached the area; the engine noise continued until he heard the sounds of rotor blades striking trees and a subsequent explosion. The helicopter struck a 60-ft-tall tree at the edge of a tree line surrounding a 2-acre residential lawn, which was located near the runway extended centerline and about 300 ft from the approach end of the runway. The debris path was oriented on a heading of 325°, and the runway was oriented on a heading of about 330°. The runway had not recently been maintained or used, as indicated by the 4-ft-tall grass on the entire runway.

Given the available evidence, the investigation could not determine why the pilot flew to the private uncharted airfield. The pilot's destination was about 13 miles northwest of the accident site, and it is unknown if or where he intended to stop along the way. No golf ball remnants were found at the accident scene, and there was no indication if the pilot planned to pick up the golf balls along the way to or at the destination.

The tall grass on the runway made the runway itself an unlikely planned landing location. The pilot was not likely performing a forced landing to the runway (or the residential lawn) because after arriving in the area, he initially flew away from the runway and lawn for an unknown amount of time before apparently lining up with the runway prior to impact. The witness information indicated that the engine was operating, and the fragmentation of the main rotor blades showed that the rotor system was rotating. Also, examination of the airframe and engine revealed no preimpact mechanical malfunctions that would have precluded normal operation.

Although postaccident toxicological testing detected tetrahydrocannabinol (THC) in the pilot's cavity blood, the blood concentration level at the time of the accident could not be reliably determined due to postmortem redistribution, during which THC levels may rise or fall. Thus, the toxicology results were inconclusive regarding when the pilot's marijuana use occurred and whether it would have had performance-impairing effects during the accident flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to maneuver the helicopter at a low altitude near trees, which resulted in collision with the trees.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Tree(s) - Decision related to condition

Factual Information

History of Flight

Maneuvering	Controlled flight into terr/obj (CFIT) (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On April 21, 2017, about 1632 eastern daylight time, a privately owned and operated Bell-Carson 47G Super C-4 helicopter, N865Z, was destroyed by impact forces and a postcrash fire near a private uncharted airfield in Timmons ville, South Carolina. The private pilot was fatally injured. The helicopter was privately owned and operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed for the local flight. The flight originated from Huggins Memorial Airport (58J) in Timmons ville about 1628.

According to the pilot's family, the purpose of the flight was to conduct a "golf ball drop" at a fundraising event about 13 miles northwest of the accident site. The pilot's family was not aware of the helicopter's planned route of flight, including any possible stops along the way.

A review of radar data from the Federal Aviation Administration (FAA), which did not include altitude data, revealed that, after the helicopter departed 58J (where the helicopter was based), it flew northwest in the general direction of the golf ball drop location. The last recorded radar data point was about 800 ft north of the accident site. At that time, the helicopter was flying northwest, away from the accident site, and its track was not aligned with the turf runway at the private uncharted airfield or the accident site. The remaining flight time and track after the radar data end, and before the helicopter collided with trees and terrain, could not be determine.

A witness at the uncharted private airfield residence, located about ¼ mile from the accident site, was outside at the time of the accident flight, heard the helicopter nearby, and thought it might have been approaching the airfield. The witness was unable to see the helicopter due to a tree line that blocked his view. He reported, "at first you could hear the rotor blades, then they got quieter and the engine sound got louder." Afterward, he heard "the rotors hitting the trees and the explosion of the crash" and saw a black plume of smoke rising from his neighbor's yard.

Pilot Information

Certificate:	Private	Age:	60,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Unknown
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Unknown
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	September 26, 2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	3600 hours (Total, all aircraft)		

According to FAA records, the pilot held a private pilot certificate with ratings for airplane single-engine land and rotorcraft-helicopter. His most recent FAA third-class medical certificate was issued on September 26, 2014, at which time he reported 3,600 hours of total flight experience. His medical certificate expired in September 2016. The pilot's logbook was not recovered, so his flight experience in this make and model helicopter, and the total number of hours that he flew between the time of his medical certificate and the time of the accident could not be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	BELL-CARSON	Registration:	N865Z
Model/Series:	47G SUPER C 4	Aircraft Category:	Helicopter
Year of Manufacture:	1962	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	C-5005
Landing Gear Type:	N/A; Skid	Seats:	4
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	2950 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	FRANKLIN
ELT:		Engine Model/Series:	6V350A
Registered Owner:	On file	Rated Power:	235 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The four-seat Bell-Carson model 47G Super C4 helicopter was manufactured in 1962. It was assembled by Carson Helicopters primarily from components manufactured by Bell Helicopters. The helicopter was powered by a 235-horsepower, six-cylinder Franklin 6V350A

engine. The helicopter's logbooks were consumed by a postcrash fire, so the helicopter's maintenance history and airframe and engine operational times could not be determined.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	FLO,151 ft msl	Distance from Accident Site:	14 Nautical Miles
Observation Time:	16:53 Local	Direction from Accident Site:	89°
Lowest Cloud Condition:	Few / 6500 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	12 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	220°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.89 inches Hg	Temperature/Dew Point:	31°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	TIMMONSVILLE, SC (58J)	Type of Flight Plan Filed:	None
Destination:	TIMMONSVILLE, SC (58J)	Type of Clearance:	None
Departure Time:	16:28 Local	Type of Airspace:	Class G

Florence Regional Airport (FLO), Florence, South Carolina, located about 14 miles east of the accident site, was the nearest weather reporting station. At 1653, the reported weather included wind from 220° at 12 knots, visibility 10 miles, few clouds at 6,500 ft, temperature 31°C, dewpoint 15°C, and an altimeter setting of 29.90 inches of mercury.

Airport Information

Airport:	private PVT	Runway Surface Type:	Grass/turf
Airport Elevation:	164 ft msl	Runway Surface Condition:	Dry;Vegetation
Runway Used:	33	IFR Approach:	None
Runway Length/Width:	2900 ft / 50 ft	VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	34.181945,-80.004165

All major components of the helicopter were accounted for at the accident site. The initial impact point was a freshly cut treetop about 60 ft above the ground and at the edge of tree line. The tail rotor personnel guard and left horizontal stabilizer were found near the base of the damaged tree along with several freshly cut branches.

The main wreckage path was about 100 ft in length and oriented on a magnetic heading of about 325°. Fragments of the main rotor blades were found in all directions from the main wreckage and within a radius of about 300 ft. The initial ground scar was about 90 ft beyond the first tree strike. The main wreckage came to rest on a 2-acre residential lawn about 100 ft to the right of the turf runway extended centerline and about 300 ft from the runway threshold. The turf runway was oriented 330° had not been recently maintained or used; the grass along the entire length of the runway was about 4 ft tall.

The helicopter came to rest inverted and oriented on a heading of about 210°. The helicopter was partially consumed by fire. The tail rotor gearbox was attached to the tailboom, which was separated at the aft center frame and was located about 50 ft southeast of the main wreckage. The right landing skid was separated from both cross-tubes, and the left skid remained attached to the front cross-tube.

The engine, transmission, and rotor mast remained together and were partially attached to the airframe and rotated about 90° aft. The main rotor hub remained mounted to the mast with both blade grips attached. The two wooden main rotor blades were fragmented with pieces scattered throughout the accident site. The metal spar and a 10-ft-long section of blade forward of the spar remained attached to one of the blade grips. The metal spar and a 1-ft section of blade remained attached to the other blade grip.

The tail rotor driveshaft was bent upward just forward of the tail rotor gearbox input quill, and tree bark was observed where the driveshaft was bent. The tail rotor driveshaft and gearbox could not be rotated due to impact damage, but, after removal of the bent driveshaft, the tail rotor gearbox rotated freely. Both metal tail rotor blades were fracture separated just outboard of the blade grips. The blades exhibited minor bending damage but were mostly intact. The blades showed no chordwise scratches or leading-edge damage other than those in the area of the separation fractures.

Both cyclic control pedestal assemblies were damaged and found separated from their mounts. Remnants of the collective control stick were found separated from the structure and mostly consumed by fire. The pilot-side and copilot-side anti-torque pedal assemblies remained connected to one another but were separated from the helicopter structure. Two cables were found attached to the damaged tail rotor quadrant; they were continuous to the overload breaks at the aft center frame. One cable was found attached to the tail rotor pitch control assembly with an overload break near the forward end of the

tailboom. The tail rotor pitch control mechanism moved smoothly when the cable was pulled.

The engine accessory section was damaged, and fragments of the engine case were separated, exposing the accessory gears. The starter, hydraulic pump, and both magnetos were separated from the engine and were fire damaged. The carburetor was partially attached to the engine; the mixture control remained attached; and the throttle control input rod end was fractured, consistent with overload. The carburetor heat plenum was separated from its mount, and the control cable remained attached to the plenum. The engine remained attached to the transmission. The crankshaft could not be manually rotated.

Most of the avionics components were partially or completely consumed by fire. The transponder could not be identified in the wreckage, its setting (STBY ON, or ALT) could not be determined. Burned paper consistent with pages of maintenance records were found throughout the main wreckage area. No remnants of golf balls were found.

Medical and Pathological Information

An autopsy of the pilot was performed by Newberry Pathology Associates, Newberry, South Carolina. The pilot's cause of death was multiple blunt force injuries.

Toxicology testing performed by the FAA Forensic Sciences Laboratory identified tetrahydrocannabinol (THC, the primary psychoactive compound in marijuana) in the pilot's liver specimens (0.0374 µg/ml) and cavity blood specimens (0.0185 µg/ml).

The testing also identified tetrahydrocannabinol carboxylic acid (THC-COOH, an inactive metabolite of THC) in the pilot's liver (0.3438 µg/ml), urine (0.3087 µg/ml), and cavity blood (0.0253 µg/ml) specimens. Cavity blood can be redistributed postmortem from other areas of the body, so the postmortem cavity blood level might be different than the level at the time of an accident.

The National Highway Traffic Safety Administration Drugs and Human Performance Fact Sheet for marijuana states the following:

It is difficult to establish a relationship between a person's THC blood or plasma concentration and performance impairing effects. Concentrations of parent drug and metabolite are very dependent on pattern of use as well as dose...most behavioral and physiological effects return to baseline levels within 3-5 hours after drug use, although some investigators have demonstrated residual effects in specific behaviors up to 24 hours, such as complex divided attention tasks. Psychomotor impairment can persist after the perceived high has dissipated.

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Neil J Baker; FAA/FSDO; Columbia, SC
Original Publish Date:	April 20, 2020
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=95041

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