Aviation Investigation Final Report

Location:	Chelsea, Alabama	**Accident Number:**	ERA23FA175
Date & Time:	April 2, 2023, 17:23 Local	**Registration:**	N231SH
Aircraft:	Airbus Helicopters EC 130 T2	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal, 1 Serious
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Medical emergency)		

Analysis

Witnesses saw a helicopter along the side of a road about 100 ft away and 3 to 4 ft above the ground. The helicopter was hovering and parallel to the road. The helicopter then rapidly ascended and turned toward the road before it moved above the witnesses' car. After several seconds, the helicopter turned back 180° toward a field, and immediately the pitched nose down and impacted the road behind them. Video from a local deputy sheriff's dash camera captured the helicopter coming over the trees, going out of view for about one second, then reappearing in a steep, nose-down attitude before impacting the road. The helicopter then slid about 20 ft before coming to rest in the grass.

Postaccident examination of the airframe and engine revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

An on-board video/data recorder was recovered from the accident scene. The video revealed that, from the time the helicopter departed on the accident flight to the time the pilot began the hover over a gravel road, the flight was uneventful. During the hover, the helicopter was moving slowly forward, and flight control inputs appeared to be normal for a hover. From the hover, the FLI increased to about 7.4 and the helicopter started to move about 50 ft forward as the altitude increased. Trees were visible forward of the helicopter outside the windscreen. While the altitude increased from about 50 ft to 110 ft above ground level (agl), the attitude indicator increased to a maximum of over 20° nose-up pitch and 20° right roll. There was no appreciable change in pedal or cyclic position by the pilot. The helicopter then went from a nose-high attitude to an excessive nose-low attitude, while continuing to roll to the right to a maximum of 30°. By the time the pilot reacted, his movement of the cyclic, left and aft, was insufficient to bring the helicopter under control. The attitude indicator tumbled, and the primary flight

display (PFD) displayed an obstacle indication. The video then showed the helicopter impacted the road at a perpendicular angle.

Toxicology testing performed by the FAA's Forensic Services Laboratory on the pilot revealed cetirizine, cyclobenzaprine, and diphenhydramine, all of which are potential central nervous system (CNS) depressants. Each drug also carries a warning that use with other CNS depressant medications is not advised, as use of these medications in combination may cause sedation, impair concentration, worsen reaction time and vigilance, and worsen psychomotor performance. The pilot's use of multiple sedating CNS depressants likely worsened this performance deficiency and contributed to his delayed application of appropriate control inputs.

Probable Cause and Findings

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

The pilot's delayed corrective inputs while maneuvering, which resulted in a loss of control. Contributing to the accident was the pilot's use of multiple sedating medications.

Findings

Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained

Factual Information

History of Flight

Maneuvering-hover	Loss of control in flight (Defining event)

On April 2, 2023, at 1723 central daylight time, an Airbus Helicopters EC130 T2 helicopter, N231SH, was substantially damaged when it was involved in an accident near Chelsea, Alabama. The pilot and flight nurse were fatally injured. The flight paramedic was seriously injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 135 air ambulance flight.

Witnesses were driving when they saw a helicopter off to the side of the road about 100 ft away and 3 to 4 ft above the ground. The helicopter was hovering, facing south, and parallel to the road. The helicopter then rapidly ascended and turned toward the road. The helicopter moved above the car for several seconds and turned 180° back toward a field, and immediately the helicopter pitched nose down and impacted the road behind them.

Another witness was outside of this house when he saw a helicopter hovering over a field across the road. He was not sure if the helicopter landed or was a few feet above the ground. He saw the helicopter's tail go straight up in the air before it then flew sideways and impacted the ground. Video from a local deputy sheriff's dash camera captured the helicopter coming over the trees, going out of view for about one second, and then reappearing in a steep, nose-down attitude before impacting the road. The helicopter then slid about 20 ft before coming to rest in the grass.

PERSONAL INFORMATION

The pilot was a helicopter pilot with an instrument rating. His total flight experience was 8,965 hours. His total flight experience with the Airbus EC 130 T2 was 18 hours.

WRECKAGE AND IMPACT INFORMATION

The accident site was located on the side of a county road. Ground impact marks were present from the middle of the road to 20 ft on the side of the road. The helicopter came to rest on its left side and oriented on a 116° magnetic heading.

The forward fuselage and left windshield were breached, and the instrument panel was separated from the panel mount but was generally intact. Heavy postcrash fire damage was observed to the engine compartment area and partially to the transmission housing area. Both left side doors exhibited impact damage and were separated from the cabin. Both right side doors remained attached to the fuselage and closed.

The tail boom was structurally separated at the aft bulkhead, but remained attached by the Fenestron control cable and electrical wiring. The Fenestron control cable was cut by recovery personnel for retrieval. When the push-pull arm was actuated by hand, all the Fenestron blades moved appropriately. The Fenestron exhibited impact damage consistent with the stators and rotors contacting the internal section of the Fenestron. The Fenestron dorsal fin and stinger exhibited damage to the composite structure. The Fenestron gearbox chip detector appeared normal. The Fenestron short drive shaft was separated at the flex coupling and found outside of the wreckage.

The hydraulic connections of each main rotor servo remained intact; no leaks were noted to the connected servos. Both hydraulic reservoirs were near empty and the supply hoses from each reservoir were thermally damaged from the postimpact fire. The aft, belt-driven hydraulic pump belt was partially consumed by the postimpact fire and no longer attached to the pump.

The main transmission was pushed down through the transmission deck several inches. Three of the four transmission suspension bars were fractured and separated about mid-span. The lower transmission chip detector was damaged and separated and could not be removed for inspection.

All three main rotor blades remained intact at the rotor head; two of the star-flex arms were fractured with 45° breaks. The outboard sections for each rotor blade exhibited broom-straw signatures consistent with ground impact damage. The cabin was equipped with a medical interior. The forward cabin, including the pilot's left-side flight controls, anti-torque pedals, cyclic, and collective were crushed aft into the fuselage approximately 2 ft. Flight control continuity was confirmed from each cockpit flight control to the main rotor and Fenestron controls. The helicopter was equipped with a Gensys Heli-SAS autopilot system. The roll trim actuator control rod was damaged and separated, displaying signatures consistent with impact. The pitch trim actuator remained intact.

Fuel was observed leaking from the fuel tank vent while the helicopter was being recovered. The helicopter's crash-resistant fuel system remained generally intact, and the fuel tank was not breached. Impact damage was observed to the surface of the tank due to impact from the bi-directional beam.

The engine was still attached to the engine deck in approximately its normally installed position. The engine cowling and inlet barrier filter was mostly consumed by the postimpact fire. The engine fuel, oil, and air connections were properly connected and secured, but suffered thermal damage from the postimpact fire.

The axial compressor blade leading edges exhibited a rough, serrated appearance consistent with hard body impact damage. All the free turbine blade roots had overload fractures that were consistent with turbine blade shedding due to free turbine overspeed. The engine-to-transmission shaft flexible coupling was torsionally splayed at the transmission-side

connection. The splined coupling (between the free turbine shaft and the reduction gearbox input pinion) was disconnected.

The airframe and engine examinations revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

According to the pilot's autopsy report issued by the Department of Forensic Sciences, Montgomery, Alabama, the cause of death was blunt force trauma.

Toxicology testing performed by the FAA's Forensic Services Laboratory on the pilot detected cetirizine in cardiac blood at 169 ng/mL and in liver tissue at 564 ng/g. Norchlorcyclizine was detected in blood and liver tissue. Cyclobenzaprine was detected in cardiac blood at 19 ng/mL and in liver tissue at 216 ng/g. Norcyclobenzaprine was detected in blood at 13 ng/mL and in liver tissue at 284 ng/g. Diphenhydramine was detected in blood at 56 ng/mL and in liver tissue. Acetaminophen was detected in cardiac blood and in liver tissue.

Cetirizine, cyclobenzaprine, and diphenhydramine are all potential central nervous system (CNS) depressants. Each drug also carries a warning that use with other CNS depressant medications is not advised, as use of these medications in combination may cause sedation, impair concentration, worsen reaction time and vigilance, and worsen psychomotor performance.

ADDITIONAL INFORMATION

An on-board Appareo Vision 1000 cockpit image recorder was recovered in the wreckage and transported to the National Transportation Safety Board's Recorders Laboratory for data download. The video revealed that from the time the helicopter took off to the time the pilot began the hover over a gravel road, the flight was uneventful. During the hover over the gravel road, the helicopter was moving slowly forward and flight control inputs appeared normal for a hover. From the hover, the FLI increased to about 7.4 and the helicopter started to move about 50 ft forward as the altitude increased. Trees were visible forward of the helicopter outside the windscreen. While the altitude increased from about 50 ft to 110 ft agl, the attitude indicator increased to a maximum of over 20° nose-up pitch, and 20° right roll. There was no appreciable change in pedal or cyclic position by the pilot. The helicopter then went from a nose-high attitude to an extreme nose-low attitude, while continuing to roll to the right to a maximum of 30°. The pilot moved the cyclic left and aft without an appreciable reaction from the helicopter. The attitude indicator tumbled, and the PFD displayed an obstacle indication. The video then showed the helicopter impact the road at a perpendicular angle.

Pilot Information

Certificate:	Commercial	**Age:**	63,Male
Airplane Rating(s):	None	**Seat Occupied:**	Front
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 28, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 1, 2023
Flight Time:	8965 hours (Total, all aircraft), 18 hours (Total, this make and model), 8495 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus Helicopters	**Registration:**	N231SH
Model/Series:	EC 130 T2	**Aircraft Category:**	Helicopter
Year of Manufacture:	2014	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	7993
Landing Gear Type:	None; Skid	**Seats:**	8
Date/Type of Last Inspection:	April 2, 2023 Continuous airworthiness	**Certified Max Gross Wt.:**	5512 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	6616 Hrs as of last inspection	**Engine Manufacturer:**	Turbomeca
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	Arriel 2D
Registered Owner:	AIR METHODS CORP	**Rated Power:**	
Operator:	AIR METHODS CORP	**Operating Certificate(s) Held:**	On-demand air taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BHM,630 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	17:53 Local	**Direction from Accident Site:**	340°
Lowest Cloud Condition:	Few / 5000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	23°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sylacuaga, AL (SCD)	**Type of Flight Plan Filed:**	
Destination:	Chelsea, AL	**Type of Clearance:**	None
Departure Time:	16:52 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	2 Fatal, 1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal, 1 Serious	**Latitude, Longitude:**	33.37817,-86.628454

Administrative Information

Investigator In Charge (IIC):	Boggs, Daniel
Additional Participating Persons:	Clay Perkins; FAA/FSDO; Birmingham, AL Kenneth Lancaster; FAA/FSDO; Birmingham, AL Kevin Drew; Air Methods; Thompson, CT Stephane Veillon; BEA investigations; LeBourget Cedex Seth Buttner; Airbus helicopters; Grand Prairie, TX Bryan Laimore; Safran Helicopters; Grand Prairie, TX
Original Publish Date:	June 4, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=106990