Aviation Investigation Final Report

Location:	Alpine, Alabama	**Accident Number:**	ERA21LA269
Date & Time:	June 25, 2021, 16:50 Local	**Registration:**	N372NS
Aircraft:	GARLICK HELICOPTERS INC OH-58A+	**Aircraft Damage:**	Substantial
Defining Event:	Low altitude operation/event	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot had completed multiple aerial application flights over a cornfield on the day of the accident. During the accident flight, the helicopter contacted a fiber-optic cable that was collocated with high-voltage transmission lines. The wire strike resulted in a loss of control, and the helicopter impacted terrain, fatally injuring the pilot and substantially damaging the helicopter.

A video recording of the helicopter during a previous application flight that day revealed that the helicopter was flying at low altitude and below the trees and powerlines that surrounded the field. After each pass over the field, the helicopter gained altitude to clear the surrounding trees and powerlines, turned back, and then descended again below the trees and powerlines for the next pass. Also, a witness heard a helicopter that sounded as if it was flying “real low,” but she could not see the helicopter because of trees. The witness reported that she heard a sound “like propellers hitting a tree, and then a boom like an explosion.”

No evidence indicated a preimpact mechanical malfunction or anomaly that would have precluded normal operation of the helicopter. Postaccident examination of the wreckage revealed that one of the main rotor blades displayed an area, on the outboard section of the blade, that contained leading-edge damage, a wire strike signature about 8 inches inboard of the blade tip and scratching oriented at an angle that was about 45°-from the tip inward and toward the trailing edge. The other main rotor blade was missing about 3 1/2 ft of the outboard portion of the blade. These observations were consistent with the helicopter being in a right turn when the main rotor blades contacted the fiber-optic cable.

It is likely that the pilot lost positional awareness during the turnaround at the end of the final application pass. Also, because the helicopter was not equipped with a wire strike prevention

system and the transmission lines did not have fixed aerial obstruction features such as wire markers, which would have made the transmission lines more visible, the pilot's attention was not likely drawn to the wires before the wire strike. Additionally, even though the helicopter was equipped with a wire strike protection system, the areas of damage on the outboard portions of the main rotor blades indicated that the contact with the fiber-optic cable likely occurred outside of the effective angle of the cable cutters.

Probable Cause and Findings

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

The pilot's failure to maintain clearance from powerlines during a low-level aerial application flight, resulting in main rotor blade impact with a fiber-optic cable, a loss of control, and the helicopter's subsequent impact with terrain.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Identification/recognition - Pilot
Personnel issues	Monitoring environment - Pilot
Environmental issues	Wire - Effect on equipment
Environmental issues	Wire - Decision related to condition
Environmental issues	Wire - Response/compensation

Factual Information

History of Flight

Maneuvering-low-alt flying	Low altitude operation/event (Defining event)
Maneuvering-low-alt flying	Part(s) separation from AC
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On June 25, 2021, about 1650 central daylight time, a Garlick Helicopters OH-58+, N372NS, was substantially damaged when it was involved in an accident in Alpine, Alabama. The pilot was fatally injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight.

Before the accident flight, the pilot, along with a loader/fueler (ground crewmember), had been conducting chemical spraying operations from an abandoned drag strip about 3/4 mile southwest of the accident site. The ground crewmember stated the pilot had sprayed about 5 loads (500 acres) and had 5 loads remaining to spray. Each load took between 15 and 20 minutes. The ground crewmember was not aboard the helicopter during the accident flight.

About 1650, a local resident heard a helicopter that was flying “real low,” but she could not see the helicopter because of trees. The helicopter kept getting closer, and she heard a sound “like propellers hitting a tree, and then a boom like an explosion.” When she eventually saw the helicopter, it was “turned all to pieces.” The local resident could smell fuel, and she “started to see a little bit of smoke, but there was no fire.”

A video recording captured the helicopter during an application flight over an adjacent cornfield before the accident flight. Review of the video recording revealed that the helicopter was flying at a low altitude and below the trees and powerlines that surrounded the field, and the helicopter would gain altitude at the end of each pass over the field to clear the surrounding trees and powerlines. The helicopter would then turn back and descend once again below the trees and powerlines for the next pass.

According to Federal Aviation Administration (FAA) and pilot records, the pilot held a type rating in the C/S-70 (UH-60) helicopter. He had accrued flight time in multiple aircraft, including the PA-28, 7GCAA, C150, C170, C210, S2R-T34, OH-58, and UH-60.

On June 22, 2005, the helicopter was involved in an accident while maneuvering during an aerial application flight in Graham, Texas (NTSB case no. DFW05CA172). The helicopter struck wires during a pull-up maneuver. Evidence at the accident site showed that the tailboom struck the top wire of a high-tension string and separated in flight. After the tailboom separated, the helicopter entered an uncontrolled descent to ground impact. The wires did not have fixed aerial obstruction features (for example, orange balls) installed to make the wires more

conspicuous. A review of FAA airworthiness records revealed that FAA Form 337, Major Repair and Alteration, had not been filed with the FAA when the helicopter was rebuilt after the accident.

At the time of the accident, the helicopter was equipped with high-skid landing gear; a spray system; and a wire strike protection system, which consisted of cable cutters mounted above the windshield and below the forward fuselage. The helicopter was not equipped with a wire strike prevention system.

The helicopter was not required to have, and was not equipped with, a cockpit voice recorder or a flight data recorder. Other electronic devices that might have contained nonvolatile memory were recovered from the wreckage, including a Garmin GPS unit and an Ag-Nav unit. The NTSB Vehicle Recorders Laboratory found that the GPS track log recording function was "off," so no data could be recovered. Also, the internal memory module from the Ag-Nav unit was removed and sent to the manufacturer, which determined that the module sustained internal damage and that no data could be recovered.

Examination of the accident site indicated that the helicopter had struck a fiber-optic cable that was collocated with high-voltage transmission lines on the south side of the cornfield and then impacted terrain about 415 ft from the initial wire strike with the fiber-optic cable. The transmission lines were not equipped with wire markers (aircraft warning markers). Further examination of the accident site revealed a debris path that contained a piece of cable in a tree near the south side of the field and a section of bent cable core that had come to rest in the cornfield. This debris path began near the area of the wire strike and continued on a magnetic heading of about 300° to the helicopter's impact location.

Examination of the helicopter revealed that it was substantially damaged and had broken into numerous pieces on impact, with the landing gear (skids), fuselage, and tailboom all receiving varying degrees of impact damage. Further examination of the helicopter also revealed that the main rotor mast, pitch change links, main rotor hub, tail rotor, and tail rotor drive shaftwere substantially damaged.

Examination of the flight control system revealed numerous breaks in the cyclic control system, collective control system, and anti-torque system. Flight control continuity was able to be established from the cockpit to the breaks in the flight control system, and from the breaks in the system to the main rotor and tail rotor.

Examination of the engine revealed that it displayed signatures consistent with operation during the impact sequence as some of the blades in the compressor section downstream of the air inlet were broken off opposite the direction of rotation, with the remaining blades displaying bend back and leading edge gouging. Additionally, rotational scoring was present on the walls of the compressor section.

Examination of the drive train revealed that the tail rotor drive shaft displayed twisting at several breaks in the drive shaft which was indicative of production of engine power. Drivetrain

continuity was able to be established from the engine to the main transmission and from the main transmission to the rotor head. Drivetrain continuity was also established from the main transmission to the breaks in the tail rotor drive shaft and from the breaks in the tail rotor drive shaft to the tail rotor gearbox, and from the tail rotor gearbox to the tail rotor. Both the main rotor hub and tail rotor could be rotated by hand, and the magnetic chip detectors were free of debris.

Examination of the two tail rotor blades revealed that they had remained attached, but both had been bent near the blade root, with one blade bent about 45 degrees away from the tail boom, and the other bent about 135 degrees towards the tail boom.

Examination of the two main rotor blades revealed that one blade displayed an area, on the outboard section of the blade, that contained leading-edge damage, scratching oriented at an angle of about 45° from the tip inward and toward the trailing edge. That same blade had a wire strike signature about 8 inches inboard of the blade tip. The other blade was missing about 3 1/2 ft of the outboard portion of the blade.

According to the FAA Safety Briefing magazine article, "Avoiding Wire Strikes in Rotorcraft Operations," dated October 30, 2020, the number of wire strike accidents has increased, and wire strikes remain one of the leading fatal accident causes in low-level helicopter operations. The safety briefing continued as follows:

> *Many pilots mistakenly believe that just watching for wires will provide sufficient reaction time. Statistics show that all pilots flying low are susceptible to a strike, regardless of experience and ability. Several capable and experienced pilots who have survived a wire strike say the same things: 'I just didn't see it.' 'The wires just appeared.' 'There was no time to think or react.'*

According to the US Energy Information Administration, the United States has about 200,000 miles of high-voltage transmission lines and millions of miles of low-voltage distribution lines throughout the United States. Wire strike hazards exist for operations below 500 ft above ground level. Because this environment has an inherent risk of wire strikes, flight crews must be properly trained to assess the environment and verify the presence of wires without relying solely on "see and avoid." The FAA Safety Briefing article presented the following tips for wire hazard mitigation:

- *Avoid low-level flight whenever it is not essential to the operation.*
- *Become familiar with all known hazards in the operations area prior to low-level flight.*
- *Brief all crew and passengers to speak up and be specific if they see power lines, towers, or other obstacles.*

- *Look for all indicators of a power line (e.g., right of way clearing or support structures).*
- *Always cross transmission lines at the point of the supporting structure.*
- *Be prepared to climb out of the wire environment if any distraction or confusion occurs (e.g., irrelevant crew conversation, radio call, etc.).*
- *Assume that wires are always present in any unfamiliar operations area until proper high reconnaissance confirms otherwise.*

Pilot Information

Certificate:	Commercial	**Age:**	30,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
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 Without waivers/limitations	**Last FAA Medical Exam:**	March 9, 2021
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 27, 2021
Flight Time:	(Estimated) 1255 hours (Total, all aircraft), 840 hours (Total, this make and model), 1030 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GARLICK HELICOPTERS INC	**Registration:**	N372NS
Model/Series:	OH-58A+	**Aircraft Category:**	Helicopter
Year of Manufacture:	1970	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	70-15372
Landing Gear Type:	None; High skid	**Seats:**	3
Date/Type of Last Inspection:	March 24, 2021 100 hour	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	7827.1 Hrs as of last inspection	**Engine Manufacturer:**	Allison
ELT:	Not installed	**Engine Model/Series:**	T63-A-720
Registered Owner:	EWING FLYING SERVICE LLC	**Rated Power:**	420 Horsepower
Operator:	EWING FLYING SERVICE LLC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)
Operator Does Business As:		**Operator Designator Code:**	4EWG

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSCD,569 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	17:15 Local	**Direction from Accident Site:**	212°
Lowest Cloud Condition:	Scattered / 4000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 11000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	29°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Alpine, AL (None)	**Type of Flight Plan Filed:**	None
Destination:	Alpine, AL (None)	**Type of Clearance:**	None
Departure Time:	16:45 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.256369,-86.251594(est)

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	Randy Durley; FAA/FSDO; Birmingham, AL
Original Publish Date:	August 30, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=103346