



Aviation Investigation Final Report

Location: Renfrew, Pennsylvania Accident Number: NYC02LA184

Date & Time: September 7, 2002, 14:00 Local Registration: N373TG

Aircraft: Graham Mini-500 Aircraft Damage: Substantial

Defining Event: Injuries: 1 Fatal

Flight Conducted Under: Part 91: General aviation - Personal

Analysis

The amateur built helicopter was reported missing, and then located the following day. No information regarding the en route portion of the flight was available. No witnesses reported seeing the accident, and the pilot was not in radio contact with any air traffic control facilities, or automated flight service stations. The helicopter had a total of 25.6 hours of operation since construction. Examination of the wreckage revealed minor damage to both main rotor blades. Flight control continuity was confirmed from the cockpit to the main rotor and tailrotor. The transmission chip detector had metal fragments on it, the transmission oil contained suspended metal particles, and small pieces of metal were retrieved, with a magnet, from within the transmission. Examination of the engine revealed no preimpact failures or malfunctions.

Probable Cause and Findings

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

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: CRUISE

Findings

1. (C) ROTOR DRIVE SYSTEM, MAIN GEARBOX/TRANSMISSION - FAILURE

Occurrence #2: LOSS OF CONTROL - IN FLIGHT Phase of Operation: DESCENT - UNCONTROLLED

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

2. TERRAIN CONDITION - GRASS

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Factual Information

On September 7, 2002, about 1400 eastern daylight time, a Mini-500 homebuilt helicopter, N373TG, was substantially damaged when it impacted terrain near Renfrew, Pennsylvania. The certificated private pilot was fatally injured. Visual meteorological conditions prevailed for the personal flight that departed the Butler Farm Show Airport (3G9), Butler, Pennsylvania, destined for the Zelienople Municipal Airport (8G7), Zelienople, Pennsylvania. A flight plan was not filed, and the flight was conducted under 14 CFR Part 91.

The helicopter was reported missing on September 7, 2002, and was located on September 8, 2002. No information regarding the en route portion of the flight was available. No witnesses reported seeing the accident, and the pilot was not in radio contact with any air traffic control facilities, or automated flight service stations. The accident time was approximated by using the time of departure, the distance from the departure airport to the accident site, and the amount of fuel estimated to be at the accident site.

The pilot held a private pilot certificate with an airplane single engine land rating, and a helicopter rating. On his last Federal Aviation Administration (FAA) third-class medical certificate, which was dated June 7, 2001, he reported a total flight experience of 520 hours. The pilot's logbook was not located at the accident site and follow on attempts to find it were unsuccessful.

According to an FAA inspector, the helicopter had a total of 25.6 hours of operation since construction. Examination of the wreckage revealed minor damage to both main rotor blades. The No. 1 tailrotor blade was bent and broken mid span, and opposite the direction of rotation. The No. 2 tailrotor blade displayed minor impact damage. Flight control continuity was confirmed from the cockpit to the main rotor and tailrotor. The transmission chip detector was removed, and metal fragments were observed. The transmission oil contained suspended metal particles, and small pieces of metal were retrieved, with a magnet, from within the transmission. Examination of the engine revealed no preimpact failures or malfunctions. The only entry in the maintenance records was date April 4, 1998, and was for certification.

An autopsy was performed on the pilot at the Butler Memorial Hospital, Butler, Pennsylvania, on September 8, 2002. The FAA Toxicology and Accident Research Laboratory in Oklahoma City, Oklahoma, performed a toxicological test on the pilot on October 15, 2002.

A weather observation was taken about 10 minutes before the accident at the Beaver County Airport (BVI), Beaver Falls, Pennsylvania, which was located approximately 21 miles to the west of the accident site. According to the observation, the wind was 360 degrees at 8 knots, visibility was 10 miles, ceiling was 4,000 feet broken, temperature was 73 degrees Fahrenheit, dew point was 50 degrees Fahrenheit, and the altimeter setting was 30.23 inches of mercury.

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According to FAA Advisory Circular AC 20-27D, Certification and Operation of Amateur-Built Aircraft, "the amateur-built program was designed to permit person(s) to build an aircraft solely for educational or recreational purposes. The FAA has always permitted amateur builders freedom to select their own designs. The FAA does not formally approve these designs since it is not practicable to develop design standards for the multitude of unique design configurations generated by kit manufacturers and amateur builders." It also stated, "Since 1983, FAA inspections of amateur-built aircraft have been limited to ensuring the use of acceptable workmanship methods, techniques, practices, and issuing operating limitations necessary to protect persons and property not involved in this activity."

Pilot Information

Certificate:	Private	Age:	51,Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medicalw/ waivers/lim	Last FAA Medical Exam:	June 1, 2001
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	
Flight Time:	520 hours (Total, all aircraft)		

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Aircraft and Owner/Operator Information

Graham	Registration:	N373TG
Mini-500	Aircraft Category:	Helicopter
	Amateur Built:	Yes
Experimental (Special)	Serial Number:	373
Skid	Seats:	2
	Certified Max Gross Wt.:	840 lbs
	Engines:	1 Reciprocating
25.6 Hrs at time of accident	Engine Manufacturer:	Rotax
Not installed	Engine Model/Series:	582
Thomas Graham	Rated Power:	67 Horsepower
	Operating Certificate(s) Held:	None
	Mini-500 Experimental (Special) Skid 25.6 Hrs at time of accident Not installed	Mini-500 Aircraft Category: Amateur Built: Experimental (Special) Serial Number: Skid Seats: Certified Max Gross Wt.: Engines: 25.6 Hrs at time of accident Not installed Engine Manufacturer: Not installed Engine Model/Series: Thomas Graham Rated Power: Operating Certificate(s)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	BVI,1253 ft msl	Distance from Accident Site:	21 Nautical Miles
Observation Time:	13:50 Local	Direction from Accident Site:	270°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Broken / 4000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	360°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.22 inches Hg	Temperature/Dew Point:	23°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Butler, PA (3GN)	Type of Flight Plan Filed:	None
Destination:	Zelienople, PA (8G7)	Type of Clearance:	None
Departure Time:	13:30 Local	Type of Airspace:	Class G

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Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	40.806388,-79.964447

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Administrative Information

Investigator In Charge (IIC):	Muzio, David	
Additional Participating Persons:	Henry Vejlstrup; FAA\FSDO; Allegheny, PA	
Original Publish Date:	July 23, 2003	
Last Revision Date:		
Investigation Class:	<u>Class</u>	
Note:		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55645	

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 Code of Federal Regulations section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 United States Code section 1154(b)). A factual report that may be admissible under 49 United States Code section 1154(b) is available here.

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