



Aviation Investigation Final Report

Location:	Fort Benning, Georgia	Accident Number:	DCA21LA094
Date & Time:	March 1, 2021, 17:00 Local	Registration:	N314AQ
Aircraft:	Bell APT70	Aircraft Damage:	Substantial
Defining Event:	Flight control sys malf/fail	Injuries:	N/A
Flight Conducted Under:	Public aircraft		

Analysis

According to the operator/manufacturer, the flight was a demonstration for a component of the U.S. Army in a remote area on the grounds of Fort Benning, Georgia. The APT-70 is an unmanned aircraft with vertical take-off and landing (VTOL) capability. Takeoff and landing is conducted in a “tail-sitter” configuration and lifts off with four quad-rotor propellers providing powered lift. The aircraft transitions to forward flight using the propellers for thrust, and a bi-wing configuration for lift.

During the flight, the Electronic Speed Controller (ESC) on the number 1 motor faulted, resulting in a loss of thrust from that motor. The aircraft flight controller automatically reduced thrust on the opposite motor to maintain stable attitude control, which caused an overall reduction in thrust and led to a descent and to impact with trees. The aircraft was substantially damaged and there were no injuries.

The aircraft is capable of entering a hover and controlled descent in the event of a failed motor; however, this maneuver requires crew action. The impact with the trees occurred about 5 seconds after the failure, before the pilot could take action. The operator/manufacturer identified an ambiguous paragraph in their safety checklist regarding the appropriate response to ESC failure.

The examination of flight data and the ESC by the operator/manufacturer identified a cracked ceramic capacitor in the ESC circuitry.

Probable Cause and Findings

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

failure of an electronic speed controller that resulted in a descent and impact with trees.

Findings

Aircraft

(general) - Failure

Factual Information

History of Flight

Enroute	Flight control sys malf/fail (Defining event)
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Pilot Information

Certificate:	Commercial; Flight instructor	Age:	31
Airplane Rating(s):	Single-engine land	Seat Occupied:	None
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	
Instructor Rating(s):	Airplane single-engine; Helicopter	Toxicology Performed:	
Medical Certification:	Unknown	Last FAA Medical Exam:	
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	October 13, 2020
Flight Time:	(Estimated) 0 hours (Total, all aircraft), 0 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N314AQ
Model/Series:	APT70	Aircraft Category:	Powered-lift
Year of Manufacture:	2020	Amateur Built:	
Airworthiness Certificate:	Experimental (Special)	Serial Number:	6
Landing Gear Type:	Other launch/recovery system	Seats:	0
Date/Type of Last Inspection:	September 22, 2020 Unknown	Certified Max Gross Wt.:	400 lbs
Time Since Last Inspection:		Engines:	4 Electric
Airframe Total Time:		Engine Manufacturer:	Hacker
ELT:		Engine Model/Series:	
Registered Owner:	Bell Helicopter Textron	Rated Power:	
Operator:	Bell Helicopter Textron	Operating Certificate(s) Held:	Certificate of authorization or waiver (COA)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KCSG	Distance from Accident Site:	2 Nautical Miles
Observation Time:	17:00 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:		Visibility	6 miles
Lowest Ceiling:	Overcast / 7000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	333°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	18°C
Precipitation and Obscuration:			
Departure Point:	Fort Benning, GA	Type of Flight Plan Filed:	None
Destination:	Fort Benning, GA	Type of Clearance:	None
Departure Time:		Type of Airspace:	Military operation area

Wreckage and Impact Information

Crew Injuries:	N/A	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	N/A	Latitude, Longitude:	32.35339,-84.952859(est)

Administrative Information

Investigator In Charge (IIC): English, William

Additional Participating Persons:

Original Publish Date: January 6, 2022

Last Revision Date:

Investigation Class: [Class 4](#)

Note: The NTSB did not travel to the scene of this accident.

Investigation Docket: <https://data.ntsb.gov/Docket?ProjectID=102742>

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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](#).