



Aviation Investigation Final Report

Location:	Baxley, Georgia	Accident Number:	ATL04LA126
Date & Time:	June 13, 2004, 22:45 Local	Registration:	N8451E
Aircraft:	Piper PA 32R-301	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While flying at 2300 feet, the pilot shut off the autopilot and immediately could not maintain pitch control and the airplane went into a series of uncontrollable gyrations. The pilot attempted to regain control of the airplane but was unsuccessful. The airplane collided with trees five miles west of Baxley Municipal Airport. During the post accident functional examination of the autopilot assembly disclosed that when the unit was engaged the pitch servo would only correct the pitch attitude in one direction. Internal examination of the pitch servo revealed that three transistors had been replaced and one transistor appeared original to the unit. Additionally, the functional check of the pitch trim servo solenoid revealed that the unit was not within the design specifications. According to the pilot operating handbook, if the autopilot is disengaged when opposing mistrim forces are encountered, the pilot may be required to exert control forces in excess of 50 pounds to maintain airplane attitude. The pilot will have to maintain this control force while he manually retrim the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The mechanical malfunction of the autopilot pitch servo, and the pilot's inability to maintain adequate control pressure to manually retrim the pitch attitude.

Findings

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

Phase of Operation: APPROACH

Findings

1. (C) AUTOPILOT/FLIGHT DIRECTOR,SERVO - FAILURE

Occurrence #2: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: APPROACH

Findings

2. EMERGENCY PROCEDURE - NOT SUCCESSFUL - PILOT IN COMMAND

3. (C) PHYSICAL STRENGTH OVERLOAD - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT

Phase of Operation: APPROACH

Findings

4. OBJECT - TREE(S)

Factual Information

On June 13, 2004, at 2245 eastern daylight time, a Piper PA-32R-301, N8451E registered to and operated by the private pilot collided with trees while on approach to Baxley Municipal Airport, Baxley, Georgia. The personal flight operated under the provisions of Title 14 CFR Part 91. Visual meteorological conditions prevailed and an instrument flight plan was filed. The airplane was substantially damaged. The pilot was seriously injured. The flight originated from Fulton County Airport, Wauseon, Ohio on June 13, 2004 at 1800 central daylight time.

While enroute at 2300 feet, the pilot checked the weather at Baxley Municipal Airport, and with the airport in sight, the pilot decided to cancel his instrument flight plan. The pilot shut off the autopilot and immediately afterward, the pilot discovered that he could not maintain pitch control. As the airplane went into a series of uncontrollable gyrations, the pilot attempted to disable the electric pitch trim but was limited because of the physical force needed on the yoke. The pilot's attempts to regain control of the airplane were unsuccessful. The airplane descended and collided with trees five miles west of Baxley Municipal Airport.

Examination of the airplane at the accident site revealed the left wing was severed approximately three feet outboard of fuselage, and the right stabilator assembly was deflected aft 90 -degrees severed at the right side of the airframe.

The functional examination of the autopilot components revealed the pitch servo was only correcting itself in one direction; as viewed at the capstan, the unit would run clockwise but not counter-clockwise. Internal examination of the unit revealed three transistors had been replaced and one transistor appeared to have been original to the unit. The transistor that appeared original to the unit is for the clockwise motion; the motor in the unit also appeared to have been original. The functional examination also disclosed that trim springs were out of design specifications, but the clockwise speed was within specifications and the tachometer output was out of design specifications. External examination of the tachometer revealed that it had been previously repaired and a lacquer or glue compound had been applied. The servo solenoid specifications are 21.87 lbs; the solenoid was observed to hold in the counter-clockwise direction, but would allow popping off at 15 to 18 lbs in the clockwise direction. Also, the servo mount, from the pitch servo unit, specifications are 50 lbs plus or minus 5 lbs. The unit was observed to be set at 67 lbs for clockwise direction and 65 lbs for counter-clockwise direction.

According to a caution note in the emergency procedures of the pilot operating handbook, "when disconnecting the autopilot after a trim malfunction, hold the control wheel firmly (up to 45 pounds of force on the control wheel may be necessary to hold the aircraft level)." Additionally, "if the autopilot is disengaged under these conditions (opposing mistrim forces) the pilot may be required to exert control forces in excess of 50 pounds to maintain airplane

attitude. The pilot will have to maintain this control force while he manually retrim the airplane.
 "

Pilot Information

Certificate:	Private	Age:	66, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical-w/ waivers/lim	Last FAA Medical Exam:	January 14, 2004
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	February 3, 2003
Flight Time:	957 hours (Total, all aircraft), 315 hours (Total, this make and model), 43 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N8451E
Model/Series:	PA 32R-301	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	32R-8113122
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	June 4, 2004 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:	4 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2666 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540 SER
Registered Owner:	Richard Helminiak	Rated Power:	300 Horsepower
Operator:	Richard Helminiak	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:	KAYS,142 ft msl	Distance from Accident Site:	27 Nautical Miles
Observation Time:	21:00 Local	Direction from Accident Site:	180°
Lowest Cloud Condition:	Scattered / 8000 ft AGL	Visibility	7 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	0 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	0°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.1 inches Hg	Temperature/Dew Point:	23°C / 22°C
Precipitation and Obscuration:			
Departure Point:	Wauseon, OH (KUSE)	Type of Flight Plan Filed:	IFR
Destination:	Baxley, GA (KBHC)	Type of Clearance:	IFR
Departure Time:	18:00 Local	Type of Airspace:	Class E

Airport Information

Airport:	Baxley Municipal Airport KBHC	Runway Surface Type:	Grass/turf
Airport Elevation:	201 ft msl	Runway Surface Condition:	Vegetation
Runway Used:		IFR Approach:	Visual
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	31.713611,-82.393608

Administrative Information

Investigator In Charge (IIC):	Powell, Phillip
Additional Participating Persons:	Bob Maynard; Atlanta FSDO; College Park, GA
Original Publish Date:	January 31, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=59443

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](#).