National Transportation Safety Board
Aviation Accident Final Report

Location:	Jesup, GA	**Accident Number:**	ATL03FA009
Date & Time:	10/23/2002, 2128 EDT	**Registration:**	N73CR
Aircraft:	Beechcraft A60	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane was equipped with two experimental Engine AIR Power Systems TSIVD-427, 500-horsepower, liquid-cooled, turbocharged, V8 engines. During previous flights, the right engine lost boost then overboosted intermittently, and attempted repairs were unsuccessful. The pilot elected to fly the airplane to its home base for further troubleshooting. During cruise flight, the pilot reported an engine was surging, declared an emergency, and received vectors toward the airport. The airplane collided into a field beside the airport runway and caught fire. The airplane had a total of 8 to 10 hours of flight time at the time of the accident. Records revealed that two days after the airplane's first test flight, the pilot flew the airplane from Melbourne, Florida, to an airport 336 nm miles away, then flew it to Canada to display it at a fly-in.The FAA operating limitations for the airplane restricted its operation to flight test only, which was proposed to consist of 100 flight hours, since the installation of the modified engines. No single-engine performance data was available for this airplane. Examination of the engines and accessories revealed extensive fire and impact damage. Continuity of the crankshaft, valves, rods, and pistons was established for the right engine by manually rotating the propeller reduction control unit.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The loss of power in one engine and the loss of control for undetermined reasons.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE - NORMAL

Findings
1. 1 ENGINE
2. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (C) REASON FOR OCCURRENCE UNDETERMINED
4. PERFORMANCE DATA - NOT AVAILABLE - OWNER/BUILDER

Occurrence #4: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - EMERGENCY

Findings
5. TERRAIN CONDITION - OPEN FIELD

Factual Information

HISTORY OF FLIGHT

On October 23, 2002, at 2128 eastern daylight time, an experimental Beechcraft A60, N73CR, registered to Duke Aircraft Corporation and operated by the pilot, collided with the ground and caught fire during an emergency landing at the Jesup Wayne County Airport in Jesup, Georgia. The personal flight was operated under the provisions of Title 14 CFR Part 91 with an instrument flight rules plan filed. Visual meteorological conditions prevailed. The Canadian-certificated airline transport pilot and the private pilot-rated passenger received fatal injuries, and the airplane was destroyed. The flight departed Delaware County Johnson Field in Muncie, Indiana, at 1832 on October 23, 2002.

A review of flight service station records revealed the pilot obtained a weather briefing and filed an instrument flight rules plan for a flight from Muncie, Indiana, direct to Melbourne, Florida. At 1832:54, the pilot contacted Muncie Air Traffic Control and reported climbing from the airport.

During cruise flight at 12,000 feet mean sea level over Reidsville, Georgia, the pilot contacted Jackson Air Route Traffic Control Center at 2109:05 and stated he wanted to land because of "difficulties with an engine." The controller stated to the pilot he had just passed over the Reidsville, Georgia, airport, and the Jesup, Georgia, airport was ahead. The pilot requested and received radar vectors for the Jesup, Georgia, airport, and the controller issued a clearance to descend. At 2115:22, the pilot reported, "We have an engine that's surging," and, at 2115:30, the pilot declared an emergency.

A witness in Reidsville, Georgia, stated he heard a strange-sounding airplane flying north to south overhead at 2110. He heard one engine running smoothly, and the other engine sounded like it would repeatedly come up full throttle, then "die down" for four or five seconds, then come up full throttle again. He stated it was not popping or sputtering.

At 2120:36, the controller told the pilot he passed the airport, and the controller provided vectors to bring the flight back for the approach. At 2122:52, the controller told the pilot radar contact was lost. At 2123:22, the controller told the pilot to climb back up to the assigned altitude of 2,000 feet mean sea level, and the pilot replied, "We can't get any climb." At 2123:57, the pilot stated, "we have a rotating beacon at twelve o'clock," and, at 2126:07, the pilot stated, "charlie romeo has the field." No further radio transmissions were received from the pilot.

Two witnesses within four miles of the airport described airplane engine noises that sounded like "a Gatling gun cutting in and out," "a dragster car starting up," or the sound heard when a car is driven over rumble strips. Local law enforcement and rescue personnel who were dispatched to the airport observed the airplane engulfed in flames in a field beside the runway.

PERSONNEL INFORMATION

The pilot held a Canadian airline transport certificate for single-engine and multi-engine land airplanes issued on January 9, 2001, and a U.S. special purpose commercial pilot foreign-based certificate for single-engine and multi-engine land airplanes issued on May 20, 1997. Transport Canada Aviation System Safety, Ontario, Canada, reported the pilot held a category 1 medical certificate issued on May 10, 2002, with the notation "glasses or contacts worn." The pilot's

logbook was not recovered for examination. A review of flight training records provided by the facilitators of a Beechcraft Duke Recurrent Training course revealed the pilot completed a biennial flight review and instrument competency check on September 25, 2002.

The passenger held a private pilot certificate for airplane single-engine land issued on October 5, 1994. He held a third class medical dated September 12, 2002, with a restriction for corrective lenses.

AIRCRAFT INFORMATION

The experimental airplane was originally certificated as a Beechcraft A60. The factory-installed 380-horsepower engines were removed, and the airplane was equipped with two experimental Engine AIR Power Systems TSIVD-427, 500-horsepower, liquid-cooled, turbocharged, V8 engines with experimental MT Propeller four-bladed wood and composite propellers. The engine mounts were experimental assemblies. The left engine was equipped with a 24-volt alternator and two 12-volt batteries in series that powered the airplane's original 28-volt electrical system. Of the two batteries that comprised the 24-volt system, one battery was used exclusively for the 12-volt electrical system for the left engine power requirements. The right engine was equipped with one 12-volt alternator and one 12-volt battery that powered the 12-volt electrical system independent of the systems powered by the left engine. Each engine was equipped with a full authority digital engine control unit, electric fuel pumps, an electric ignition system, and an electronic fuel injection system that were powered by each engine's respective independent 12-volt system.

According to maintenance records, the airframe total time in service at the time of the engine installation was 5104.8 hours. Witnesses in Muncie, Indiana, and an acquaintance of the pilot reported the airplane had accumulated 8 to 10 hours since the experimental engine installation when it departed on the accident flight.

METEOROLOGICAL INFORMATION

The Savannah International Airport, Automated Surface Observation System, located 49 nautical miles northeast of the accident site, reported at 2053 conditions were winds 030 at 9 knots, visibility 10 statute miles, ceiling overcast 2,000 feet above ground level, temperature 19 degrees Celsius, dew point 17 degrees Celsius, altimeter setting 30.10 inches.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed the wreckage was fire-damaged and located in a grassy field on the left side of runway 28. The wreckage was approximately 450 feet from the edge of the runway and 1,200 feet west of the runway 28 threshold. Wreckage debris was scattered along a 67-foot path on a 275-degree magnetic heading from the initial impact ground scar.

The initial accident site ground scar contained fragments of green lens from the right wingtip navigation light, and the right wing outboard of the engine nacelle was separated and crushed aft with the fuel tank breached. Burned grass and charred ground extended from the separated wing portion and encircled the wreckage and debris field.

The fuselage, empennage, horizontal stabilizer, and elevator were found upright oriented on an approximate 090-degree magnetic heading and were fire damaged. The landing gear transmission assembly was found in a position consistent with gear extension. Melted metal skin and flight control components from the horizontal stabilizer, elevator, and empennage

were found aft of the cabin section in positions consistent with their normal locations. The vertical stabilizer with the rudder attached was found amid the horizontal stabilizer and elevator debris. The rudder cables remained attached to the rudder horn, and the elevator cables remained attached to the actuators. Control cable continuity was established from the rudder and elevator to the aft cabin floor.

The cabin and instrument panel sustained fire and crush damage. The throttle quadrant was fire damaged and crushed. The left fuel selector valve was fire damaged and in the on position, and the right fuel selector was fire damaged and found in the cross-feed position.

The right engine was found separated from the wing and was fire damaged. The right engine was found upright adjacent to the right side of the cabin debris with the forward side facing the cabin. Propeller blade fragments from the right propeller were found embedded in a series of ground scars along the wreckage path, and the charred remains of one propeller blade remained attached to the hub assembly on the engine. The propeller blade angle appeared to be in a high pitch or feathered position. The inboard portion of the right wing and wing spar were not fire damaged. The right flap and aileron were fire damaged. The right aileron control cable was traced from the bellcrank to the cockpit controls.

The left engine was separated and fire damaged and found upright adjacent to the left side of the cabin debris with the forward side facing aft. The charred remains of the propeller blades remained attached to the hub assembly on the engine. The outboard portion of the left wing, the left wing leading edge from tip to root, and the spar were not fire damaged. The left flap and the inboard portion of the aileron were fire damaged. The outboard portion of the left aileron was attached to the wing at the outboard hinge. The left aileron control cable was traced from the bellcrank to the cockpit controls.

Examination of the engines was performed on November 4, 2002. External examination revealed the engine accessories, batteries, electronic components, and full authority digital engine control units displayed fire damage. Portions of the right engine valve covers were fire damaged. Spark plugs from both the left and right engines were removed and were tan in color. Borescope examination of the cylinders on both engines revealed no evidence of abnormalities. The right engine was turned manually at the propeller reduction control unit, and continuity was established through movement of the crankshaft, valves, rods, and pistons.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsy was performed on the pilot and passenger by the Georgia Bureau of Investigation, Division of Forensic Sciences, Atlanta, Georgia. The cause of death of the pilot was reported as blunt force head trauma. The cause of death of the passenger was reported as blunt force injuries.

Forensic toxicology was performed on specimens from the pilot and from the passenger by the Federal Aviation Administration Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma. The report for the pilot stated no carbon monoxide nor cyanide was detected in the blood, and no ethanol nor drugs were detected in the urine. The report for the passenger stated no carbon monoxide nor cyanide was detected in the blood, and no ethanol nor drugs were detected in the urine.

ADDITIONAL INFORMATION

The airplane was operated under a Special Airworthiness Certificate for Research and

Development and Market Survey issued on August 30, 2002. The Experimental Operation Limitations issued by the Federal Aviation Administration for the airplane stated, "No person may operate this aircraft for other than the purpose of Research and Development / Market Survey to accomplish the flight test outlined in the applicant's letter dated August 26, 2002, describing compliance with FAR 21.193." The operating limitations further stated, "All flights in this aircraft shall be conducted ... as follows: For the purpose of Research and Development, within a 300 nm radius of Melbourne Regional Airport. For the purpose of Market Survey, within the continental United States."

On the Applicant Program Letter dated August 26, 2002, and signed by the pilot, Section 4 states: "...estimated flight hours required for program. Hrs: 100; ... estimated number of flights for the program. No. Flts: 50 - 100; ... estimated duration for programs (FAR 21.193(d)(2)). No. Days: 120 with option to extend." Section 5 states, "the areas over which the flights are to be conducted ... continental USA. Testing in the vicinity of Melbourne, Florida."

The airframe total time in service at the time of the engine installation was 5104.8 hours. A review of maintenance records revealed the airplane's first flight occurred September 20, 2002, and the airframe total time was recorded as 5106.0. On September 21, 2002, the pilot singed an entry in the maintenance log that stated, "This aircraft is in a condition for safe operation and is hereby being changed from Research and Development to Market Survey" at an airframe total time of 5107.6 hours.

According to a witness, on September 22, 2002, the airplane was flown to Aiken, South Carolina. A newspaper article from the "Sault Star" dated September 30, 2002, contains an interview with the pilot and photographs of the pilot and the airplane at a fly-in in Sault Ste. Marie, Ontario, Canada, on September 29, 2002. The witness reported that, while the airplane wasin Canada, the pilot stated there had been no-single engine performance testing done on the airplane. According to the witness, the pilot stated he wanted return the airplane to Melbourne, Florida, to fix the problems with the airplane before conducting performance testing.

Aiken, South Carolina, is 336.4 nautical miles from Melbourne, Florida. Muncie, Indiana, and Sault Ste. Marie, Ontario, Canada, is 764.3 nautical miles and 1116.7 nautical miles, respectively, from Melbourne, Florida.

Transport Canada Civil Aviation, Ontario, Canada, issued a flight permit valid from August 30, 2002, to November 30, 2002, that allowed the airplane into specified Canadian airspace. The permit stated, "This validation is subject to the following conditions: 1) Valid for purpose of Ferry Flight for maintenance purpose only, 2) Compliance with all Operating Conditions / Limitations listed on the FAA Special Airworthiness Certificate, 3) Essential flight crew only (no passengers) ... . "

According to one acquaintance of the passenger, the passenger stated the right engine intermittently lost boost, then overboosted, and that the problem began during the flight to Canada. The airplane then remained in Canada for three weeks, and a witness reported the passenger replaced the airplane's turbo pressure regulator. The airplane was ground tested then flown to Muncie, Indiana, on October 21, 2002, for avionics work.

Airframe and powerplant mechanics in Muncie, Indiana, observed the pilot and passenger checking or working on something in the right engine cowling. The pilot and passenger also

requested a 12-volt power cart and stated they were having a problem with the airplane's 12-volt electrical system.

According to two acquaintances of the passenger, prior to departing Muncie, Indiana, on the accident flight, the passenger told them the right engine was still exhibiting the boost problem, but the problem was manageable. The decision was made to return the airplane to its home base of Melbourne, Florida, for troubleshooting.

The wreckage was released to an owner's representative on December 11, 2002.

Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	05/10/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	09/25/2002
Flight Time:	8 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beechcraft	**Registration:**	N73CR
Model/Series:	A60	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Experimental	**Serial Number:**	P-222
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	09/13/2002, Condition	**Certified Max Gross Wt.:**	6775 lbs
Time Since Last Inspection:	11 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	5125 Hours at time of accident	**Engine Manufacturer:**	EngineAIR Power Systems
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIVD-427
Registered Owner:	Duke Aircraft Corporation	**Rated Power:**	500 hp
Operator:	J. P. R. Comeault	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night
Observation Facility, Elevation:	SAV, 50 ft msl	**Distance from Accident Site:**	49 Nautical Miles
Observation Time:	2053 EDT	**Direction from Accident Site:**	51°
Lowest Cloud Condition:		**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 2000 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.19 inches Hg	**Temperature/Dew Point:**	19°C / 17°C
Precipitation and Obscuration:			
Departure Point:	Muncie, IN (MIE)	**Type of Flight Plan Filed:**	IFR
Destination:	Melbourne, FL (MLB)	**Type of Clearance:**	IFR
Departure Time:	1832 EDT	**Type of Airspace:**	Class G

Airport Information

Airport:	Jesup Wayne County (JES)	**Runway Surface Type:**	Asphalt
Airport Elevation:	108 ft	**Runway Surface Condition:**	Dry
Runway Used:	28	**IFR Approach:**	ADF/NDB
Runway Length/Width:	4916 ft / 75 ft	**VFR Approach/Landing:**	Forced Landing; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	31.552500, -81.878611

Administrative Information

Investigator In Charge (IIC):	Eric H Alleyne	**Report Date:**	09/01/2004
Additional Participating Persons:	Glenn White; FAA Atlanta FSDO - 11; College Park, GA Al Joniec Timothy D Rainey; Raytheon Aircraft Company; Wichita, KS		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		