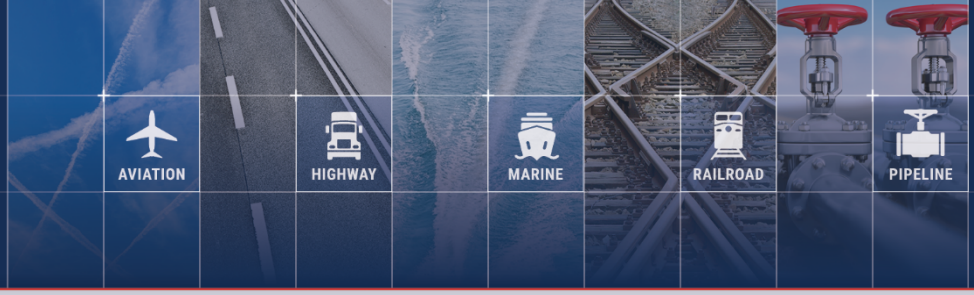

Aviation Investigation Factual Report

Location:	BIRMINGHAM, Alabama	**Accident Number:**	MIA97FA040
Date & Time:	December 16, 1996, 07:19 Local	**Registration:**	N872SD
Aircraft:	Piper PA-34-200T	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Executive/Corporate		

Factual Information

HISTORY OF FLIGHT

On December 16, 1996, about 0719 central standard time, a Piper PA-34-200T, N872SD, registered to Gulf Shores Flying Service Inc., operated by F and B Aviation Inc., as a 14 CFR Part 91 executive/corporate flight, crashed in a residential area in Birmingham, Alabama, while attempting to return to Birmingham International Airport. Visual meteorological conditions prevailed and an IFR flight plan was filed. The airplane was destroyed by a postcrash fire. The airline transport pilot, and two passengers were fatally injured. The flight originated from Birmingham International Airport about 7 minutes before the accident. Two witnesses observed the airplane at about 200 to 300 feet flying southwest bound towards the Bell South building located in the vicinity of the Alabama Power helipad, about 1/2 mile east of the Birmingham International Airport extended centerline for runway 23. The airplane pitched up and down, banked left to right,"at a very slow airspeed." "Both engines sounded like they were not at full power." The airplane disappeared from view behind an adjacent building. Another witness who was driving his truck in the vicinity of the crash site observed the accident airplane flying at a low altitude. The left propeller was not turning and the airplane appeared to attempt a landing at a park. The airplane pulled up and disappeared from view behind his truck. Other witnesses located near the crash site also observed the airplane flying towards the north at a very low altitude. The wings were wobbling left and right. The airplane made a left descending turn estimated at about a 40-degree angle of bank, in a nose high attitude. The left wing collided with a tree, separating part of the wing, continued forward, and came to rest next to a house, and a postcrash fire ensued.

Review of communications on December 16, 1997, for the time period 1256 UTC (0656 CST) to 1327 UTC (0727 CST) between Birmingham Tower, Local Control (LC), Birmingham Tower, South Radar (SR), and N872SD revealed that N872SD was cleared for takeoff on runway 23 at 1310:4. The pilot called Birmingham departure at 1311:42, stating he was runway heading out of 800 feet. Review of the Continuous Data Recording (CDR), indicates that N872SD was at 900 feet, heading south-southwest at 1312:30, and the ground speed was 95 knots. The ground speed varies from 100 knots at 1312:39 to 81 knots at 1318:30. A continuous minimum safe altitude alert began at 1313:44, and ended at 1316:03. There is a 2 minute 14 second CDR recording interruption due to an "uncoordinated" tape change by an FAA technician who was unaware of the in-flight emergency that was in progress. The following is an extract of the communications between N872SD and the appropriate controller:

1313:45 SR Senaca two sierra delta uh what does your altitude read out or your altitude indicate 1313:50 N872SD Okay Im still at a thousand feet having a little bit of a problem here I'll take care of it in a minute
1313:54 SR Okay altimeter three zero zero seven and low altitude alert suggest you

start a climb immediately to at least two thousand one hundred

1314:01 N987SD Im working on it

1314:01 SR Is there something we can help you with

1314:05 N872SD Uh dont think so

1314:08 SR Do you want to declare an emergency

1314:11 N872SD Not yet

1314:32 SR November two sierra delta are you in vfr conditions

1314:35 N772SD Affirm

1314:37 N872SD And Im going to have to come back and land

1314:39 SR All right sir do you uh are you able to maintain any kind of altitude at all the winds are one four zero at one five I can bring you right back around for five or three six or one eight three six or one eight what ever you need

1314:49 N872SD Just barely able to maintain altitude uh how about back in on five

1314:53 SR All right sir suggest you turn to the right turn back inbound for five
1314:58 SR Okay

1314:59 SR Whats the nature of your emergency just cant hold altitude

1315:01 N872SD Uh the left engine is not developing full power

1315:54 N872SD Okay uh having trouble turning here but

1316:22 N872SD Tell you what I think I can turn better to the left

1316:25 SR Okay what ever you want to do sir just hold as much altitude as you can get turned around northeast bound let me know when you see runway five

1316:31 N872SD Okay

1317:52 SR Senaca two sierra delta you see the runway now about one oclock and six miles

1317:57 N872SD Uh negative Im too low

1317:59 SR Okay uh a can you like get over to the interstate and just like fly the interstate until you can see the runway

1318:05 N872SD Im just trying to work that my way up that direction

1318:08 SR Okay sir

1318:12 SR November two sierra delta about a heading of zero four five for now that'll get you over closer to the final

1318:17 N872SD Okay working on it

1318:35 N872SD Sierra delta youve gotta find me a place to uh put it down Im in the trees right now

1318:35 SR Roger

1318:53 SR Senaca two sierra delta radar contact is lost

There were no other known radio communications with N872SD. The last recorded CDR plot was at 1318:30. (For additional information see Transcripts, Reference Aircraft Accident, N872SD, Birmingham, Alabama, December 16, 1996). PERSONNEL INFORMATION

Review of pilot flight log sheets obtained from the deceased pilot's son, revealed the pilot's first recorded flight in a PA-34-200T was January 13, 1986, in N826BB. The pilot flew N826BB until October 6, 1991. The last recorded flight in a PA-34-200T, before the accident was on December 15, 1996, in N872SD. The pilot flew the airplane for 1 hour and logged five landings. The pilot log sheet does not indicate total pilot flight hours. The pilot log sheet only indicates total hours flown for the date the pilot log sheet was completed. No logbook entries were located indicating the pilot's last biennial flight review. (For additional first pilot information see page 3 of this report).

AIRCRAFT INFORMATION

Review of oil analysis performed on oil samples taken from the left and right engine of N872SD revealed that the wear metals appeared high for low time oil, and was attributed to possible corrosion if the airplane had not been flown regularly. Aviation Oil Analysis, Phoenix, Arizona, recommended that both engines be resampled after 25 hours to monitor wear trend.

Review of aircraft work orders and discrepancy sheets on file with AMR COMBS, located at Birmingham, Alabama, and conversations with the registered owner, AMR COMBS personnel, and a representative from the perspective buyer, (Arlington Properties Inc/Beaver Construction Company/F and B Aviation Inc.), revealed that N872SD was flown from Gulf

Shores, Alabama, to Birmingham, Alabama, on November 25, 1996, for an aircraft survey/preinspection buy requested by the buyer. Mr. James H. Gray, the deceased accident pilot was acting as the coordinator, and facilitating the inspection of the airplane for the buyer, between the registered owner and AMR COMBS. A work order invoice No. 12945 was opened on November 26, 1996, by William S. Myers, AMR COMBS. The inspection was completed and the registered owner was made aware of the deficiencies by telephone. The registered owner elected to have the repairs completed at Gulf Shores, and informed the coordinator of his decision. The coordinator contacted the registered owner at a later date, and informed him that the buyer wanted an annual inspection performed on the airplane. A facsimile regarding the annual inspection was sent to the registered owner by the buyer on December 3, 1996.

The airplane was returned to AMR COMBS on December 8, 1996, to have the annual inspection completed. Work order No. 12982 was opened on December 10, 1996, by William S. Myers, AMR COMBS. According to a crew chief and the chief inspector for AMR COMBS a list of discrepancies and unairworthy items noted during the annual inspection was placed in N872SD logbook on December 12, 1996. Both stated the accident pilot/coordinator knew the airplane was in an unairworthy condition before he departed on the accident flight. The chief inspector stated he informed the registered owner of the deficiencies and also informed him that if the deficiencies were not corrected before the airplane departed AMR COMBS, that the airplane would be signed off as being unairworthy. The registered owner did not substantiate the comments made by the crew chief or the chief inspector.

According to the Executive Vice President of Arlington Properties, Inc., Hugh B. Lazenby, the registered owner of N872SD called him on December 11, 1996, and advised him that AMR COMBS had completed the annual inspection. The cost of the repairs on N872SD would be $2,600.00. It was subsequently agreed by the seller and the buyer, that the cost of repairs would be split in half, and that the airplane would remain at AMR COMBS for the repairs. Mr. Lazenby called AMR COMBS and talked with Mr. Bill Myers to see if they could make the repairs, so the sale of the airplane could be completed on December 13, 1996. Mr. Myers informed Mr. Lazenby that they were backed up, and stated that it would be about the middle of the following week before they could finish everything. Later in the morning, Mr. Nix, (the buyer) called Mr. Lazenby on the phone and asked if he could call AMR COMBS to see if the airplane could be "buttoned up" and flown on Monday with "no problems," and brought back after the flight to make the repairs. Mr. Lazenby called Mr. Myers and made the request. Mr. Myers stated he had to talk with a mechanic. Mr. Lazenby talked with Mr. Myers later in the day and was informed that his request would not be a problem. At no time did Mr. Myers inform him that the airplane was "unflightworthy" or did he detail any problems. He talked with Mr. Gray on December 12, 1996, and informed him that they would purchase the airplane on December 13, 1996. He also informed Mr. Gray that AMR COMBS stated they could fly the airplane on December 16, 1996. Mr. Gray stated most of the items listed on the inspection were just items of paperwork which needed to be caught up. Mr. Lazenby stated the invoices for the two inspections were received by Beaver Construction Company, Inc., on January 28, 1997.

The sign off on the aircraft survey, work order invoice 12945, and the annual inspection, work order invoice 12982 states:

WORK ORDER INVOICE NO. 12945

"THE WORK IDENTIFIED ABOVE WAS PERFORMED IN ACCORDANCE WITH CURRENT FEDERAL AVIATION REGULATIONS AND IS APPROVED FOR RETURN TO SERVICE. DETAILS ON FILE AT THIS FACILITY. CRS BDTR177K SIGNATURE: W S MYERS 12/16/96"

WORK ORDER INVOICE NO. 12982 "THE WORK IDENTIFIED ABOVE WAS PERFORMED IN ACCORDANCE WITH CURRENT FEDERAL AVIATION REGULATIONS AND IS FOUND IN AN UNAIRWORTHY CONDITION. A LIST OF DISCREPANCIES AND UNAIRWORTHY ITEMS HAS BEEN PROVIDED TO THE AIRCRAFT OWNER. DETAILS ON FILE AT THIS FACILITY. CRS BDTR177K SIGNATURE: W S MYERS 12/16/96"

For additional information see page 2 of this report.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. For additional information see page 4 of this report.

WRECKAGE AND IMPACT INFORMATION

The wreckage of N872SD was located about 6.86 miles southwest of Birmingham International Airport in the front yard of a residential area located at 1536 Cleveland Avenue, Birmingham, Alabama.

Examination of the crash site revealed the airplane collided with a tree about 40 feet above the base of the tree in a left descending turn on a heading of about 358 degrees magnetic. The outboard left wing tip separated 108 inches outboard of the wing root. The airplane continued forward, collided with a chimney about 23 feet above the base of the ground at 1533 Cleveland Avenue, separated the remainder of the left wing in two sections, and crossed a two-lane road. The right propeller collided with the ground, and separated at the propeller flange. The airplane rotated around the vertical axis to the left and came to rest on a heading of about 067 degrees magnetic. There was no evidence of torsional twisting, "s" bending, or chordwise scarring on the left propeller blades. Two propeller blades were bent aft and one propeller blade sustained fire damage. Torsional twisting, "s" bending, and chordwise scarring was present on all right propeller blades. The left and right fuel tanks were ruptured, and the landing gear and flaps were in the up position. A postcrash fire was initiated by electrical arcing from a power line that was damaged during the crash sequence. A section of the left wing about 51 inches in length was removed from the crash site by an unknown person.

Examination of the airframe and flight control system revealed no evidence of a precrash mechanical failure or malfunction. Continuity of the flight control system was

confirmed for pitch, roll, and yaw.

The engine assembly and accessories, and propeller system was transported to Teledyne Continental Motors, Mobile, Alabama, for examination in the presence of the FAA.

Examination of the left engine assembly and accessories revealed the engine exhibited extensive fire damage. The engine-driven fuel pump, manifold valve and lines, induction system pluming and rubber couplings, oil cooler and adapter plate, exhaust system, turbocharger, waste gate and tail pipe, induction tube from the turbocharger, and overboost valve, both magnetos, ignition harness, oil filter and adapter, starter motor, and engine mounts were removed and replaced with core engine components. The magnetos were timed and the ignition harness was connected. The original fuel nozzles were examined and found unrestricted. Thermocouples were installed and the engine was moved to an engine test cell for a test run. The engine was started. The engine would not accelerate past about 2100 rpm, and cylinder Nos. 5 and 6 were running cooler than the other cylinders. The engine was shut down and the spark plugs were changed. The engine was started, increased to 2100 rpm, and then slowly increased, and accelerated to maximum rpm and manifold pressure. The engine was left at full throttle for 15 minutes, shut down, and placed in a disassembly stand for a complete disassembly inspection. Before disassembly the top spark plugs were removed and a compression check was completed.

The No. 6 cylinder valves were removed and checked for signatures of sticking. The valve stems exhibited normal polishing signatures. Disassembly of the engine revealed normal operational signatures throughout. All internal components appeared well lubricated. The engine did not exhibit any condition that would have caused an operational problem, and the engine ran normally on the test stand after the initial problem cleared. The most likely explanation was a partially clogged fuel injection nozzle. (For additional information see Teledyne Continental Motors Analytical Inspection Report).

Disassembly of the left Ray Jay turbocharger revealed that the left turbocharger was capable of operation based on evidence of oil supply, movement of the rotating components, and overall integrity of the components. There was no evidence of rotational scoring on the turbine wheels. (For additional information see Allied Signal Aerospace letter dated January 30, 1997).

Disassembly of the left propeller assembly revealed no indication of a precrash failure or malfunction. The left propeller was being operated under low power conditions, and was probably windmilling on the low pitch stop (12 degrees) at impact. The left propeller was not at or near the feather position at impact. The left propeller sustained minimal damage with blades remaining properly seated and with no retention bearing damage. The pitch change mechanism was also found with minimal damage. The studs and dowels of the hub attachment end were undamaged as the propeller remained attached to the engine indicating a low energy impact. (For additional information see McCauley Teardown Inspection of Propellers dated February 3, 1997). Disassembly of the right engine revealed the

engine exhibited normal operational signatures throughout, except for the fire and impact damage. All internal components appeared well lubricated. The engine did not exhibit any condition that would have caused an operational problem. (For additional information see Teledyne Continental Motors Analytical Inspection Report).

Disassembly of the right Ray Jay turbocharger revealed that the turbocharger was capable of operation based on evidence of oil supply, movement of the rotating components, and overall integrity of the components. Turbine wheel scoring and turbine housing rubs indicate that the turbocharger was rotating at impact. (For additional information see Allied Signal Aerospace letter dated January 30, 1997).

Disassembly of the right propeller system revealed no evidence of a precrash mechanical failure or malfunction. The right propeller was not at or near the feather position at impact. The right propeller was being operated under substantially higher power conditions than the left propeller at impact. Damage signature markings found on various propeller components indicate an operating blade angle range higher than low pitch at time of impact. There was evidence of blade bending, twisting, and extensive lead edge scoring indicative of high rotational energy. The bearing races were fractured and the blade assemblies were unseated. All attaching studs and dowels were pulled out of the hub mounting surface. (For additional information see McCauley Teardown Inspection of Propellers dated February 3, 1997).

The left and right Hartzell propeller governors were taken to an authorized repair station for examination. The left propeller governor, model E-3, SN: 2261C, was placed in a governor test bench. The governor was increased to the take off mode. The governor developed 2, 770 rpm. The governor feathered between 1700-1690 rpm. The pressure relief valve pressure was 310 psi, and the governor was producing 19 quarts of oil per minute. The right propeller governor, model E-8L, SN:1878S, was placed in a governor test bench. The governor was increased to the take off mode. The governor would not produce rpm, oil pressure, or flow. Disassembly of the governor revealed the fly weights were frozen in the take off mode (maximum rpm). Extensive fire damage was present on the exterior and interior components.

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examination of the pilot was conducted by Dr. Gary T. Simmons, Associate Chief Corner, Medical Examiners Office, Jefferson County, Birmingham, Alabama, on December 16, 1996. The cause of death was blunt force trauma. Postmortem toxicology of specimens from the pilot was performed by the Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma. These studies were negative for alcohol and positive for neutral, acidic, and basic drugs. Hydrochlorothiazide and triamterene was detected in the blood and urine.

TEST AND RESEARCH

Three sealed metal cans containing padding with residue obtained from the crash site were forwarded to the Alabama State Department of Forensic Science, Birmingham, Alabama, for analysis. Examination of can 1 and 3 revealed no ignitable liquid residues were detected. Laboratory analysis of can 2 revealed trace amount of an ignitable liquid residue consistent with aviation gasoline. (For additional information see Fire Debris Report, Case 09-97BH26930).

A fuel sample obtained from fuel truck No. 16658 was forwarded to PANAIR Laboratory, Inc., Miami, Florida, for analysis. Examination of the fuel sample revealed the properties meet specification requirements for aviation gasoline, and that the fuel represented by this sample would not contribute to an engine malfunction. (For additional information see Gasoline Analysis Report No. 9286G).

The Piper PA-34-200 Pilot's Operating Handbook, Section 1 General, Introduction states on page 1-1, "Assurance that the airplane is in an airworthy condition is the responsibility of the owner. The pilot-in-command is responsible for determing that the airplane is safe for flight. The pilot is also responsible for remaining within the operating limitations as outlined by instrument markings, placards, and this handbook."

The Piper PA-34-200T Pilot's Operating Handbook, Section 3 Emergency Procedures, states on page 3-4, ENGINE FAILURE DURING CLIMB, "Inoperative engine prop.....FEATHER (see Engine Securing Procedure). It further states on page 3-9, ENGINE SECURING PROCEDURE (FEATHERING PROCEDURE)... Single engine performance will decrease if the propeller of the inoperative engine is not feathered."

ADDITIONAL INFORMATION

The aircraft wreckage was released to Mr. Jimmie M. Rickerson, Aeronautic Investigations Inc., Lawrenceville, Georgia, on December 17, 1996. The fire damaged logbooks were released to Mr. Robert R. Craig, Birmingham FSDO, on December 18, 1996. The left and right engine and propeller assembly were released to Mr. Joseph B. Smith, Director Air Safety Investigations, Teledyne Continental, Mobile, Alabama, on January 16, 1996. The left and right propeller governors were released to Mr. Rickerson, on January 22, 1997.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	61,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	June 4, 1996
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	20000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N872SD
Model/Series:	PA-34-200T PA-34-200T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	34-7970319
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	December 16, 1996 Annual	**Certified Max Gross Wt.:**	4570 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	1711 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed	**Engine Model/Series:**	LTS-IO-360-BB
Registered Owner:	GULF SHORES FLYING SERVICE INC	**Rated Power:**	200 Horsepower
Operator:	F AND B AVIATION INC	**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BHM ,644 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	08:13 Local	**Direction from Accident Site:**	50°
Lowest Cloud Condition:	Scattered / 4500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 7500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	-12°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(BHM)	**Type of Flight Plan Filed:**	IFR
Destination:	PENSACOLA , FL (PNS)	**Type of Clearance:**	IFR
Departure Time:	07:11 Local	**Type of Airspace:**	Class D

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	3 Fatal	**Latitude, Longitude:**	33.4608,-86.860359(est)

Administrative Information

Investigator In Charge (IIC):	Smith, Carrol
Additional Participating Persons:	ROBERT R CRAIG; BIRMINGHAM , AL DALE CARTER; MARIETTA DAVID BORDEN; MARIETTA , GA
Report Date:	June 11, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=38128

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.