Aviation Investigation Final Report

Location:	MORGANTON, North Carolina	**Accident Number:**	MIA96FA082
Date & Time:	February 18, 1996, 20:36 Local	**Registration:**	N448P
Aircraft:	Beech 95-B55	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal, 1 Serious, 3 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The owner/pilot had recently purchased the airplane. Another pilot, who had delivered the airplane to the new owner, flew with him on 2 occasions. He said the owner/pilot was about 20 knots fast on final approach and had a tendency to flare late for landing. During the accident flight, the pilot entered the traffic pattern at night and configured the airplane for landing. During the landing, the airplane touched down (bounced) nosewheel first and began to porpoise. Following the second bounce, the airplane pitched nose up, and the pilot initiated a go-around; however, the airplane bounced a third time, and the cabin door popped open. The right front seat passenger attempted to hold the door closed as the pilot continued the go-around. After the third bounce, the airplane remained airborne about 6 to 15 feet until it collided with trees beyond the departure end of the runway; then it came to rest inverted. Examination of the engines, propellers, and flight controls revealed no evidence of preimpact failure or malfunction. Calculations showed that at the time of the accident, the gross weight was 192 pounds over the maximum limit, and the center-of-gravity (CG) was 1.56 inches behind the aft limit. Also, the POH/Flight Manual indicated that the performance would be reduced with the cabin door open. The pilot had accumulated an estimated 9 hours in the accident airplane since he purchased it.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's delay in initiating a go-around (aborted landing), which resulted in his failure to obtain/maintain sufficient altitude or clearance from trees beyond the end of the runway. Factors relating to the accident were: the pilot's failure to ensure proper weight and balance of the airplane; and his improper flare and improper recovery from a bounced landing, which

resulted in porpoising of the airplane.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND
2. LIGHT CONDITION - DARK NIGHT
3. (F) FLARE - IMPROPER - PILOT IN COMMAND
4. (F) RECOVERY FROM BOUNCED LANDING - IMPROPER - PILOT IN COMMAND
5. (F) PORPOISE/PILOT-INDUCED OSCILLATION - INADVERTENT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: LANDING - ABORTED

Findings
6. (C) ABORTED LANDING - DELAYED - PILOT IN COMMAND
7. OBJECT - TREE(S)
8. (C) ALTITUDE/CLEARANCE - NOT OBTAINED/MAINTAINED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On February 18, 1996, about 2036 eastern standard time, a Beech 95-B55, N448P, crashed during a go-around after landing at the Morganton-Lenoir Airport, Morganton, North Carolina. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 CFR Part 91 personal flight. The airplane was destroyed by impact and a postcrash fire, and the airline transport-rated pilot, and one passenger were fatally injured. One passenger sustained serious injuries and three passengers sustained minor injuries. The flight originated about 1835, from the St. Augustine Airport, St. Augustine, Florida.

The flight departed with full fuel tanks and according to all surviving passengers, the flight was uneventful until arrival in the traffic pattern. The runway lights were illuminated when the flight arrived and the pilot turned left downwind then base and lowered the landing gear. The pilot turned onto final approach to runway 3 with the flaps lowered to an undetermined position. One of the passengers who is a pilot and an Airframe and Powerplant mechanic stated that he heard the pilot advance both propeller controls to the high rpm position while on final approach. The airplane was landed first on the nose landing gear and then began to porpoise three times each increasing in "violence" as reported by one of the passengers. After the second bounce the pilot applied power to both engines. Following the third touchdown on the nose landing gear, the cabin door popped open 3-6 inches, the airplane pitched nose up, and the right front seat passenger grabbed the door and attempted to hold it closed. The pilot retracted the landing gear, and flew above the runway about 6-15 feet. The passengers stated that the engines sounded normal when the pilot applied power and no passenger reported feeling a yawing motion from the airplane. The airplane continued flying past the departure end of the runway and while in a slight right wing low attitude, the right wing first collided with a tree. The airplane then yawed and rolled to the right, descended through trees, impacted the ground, and came to rest inverted. The passengers seated in the rear seats each released their own restraints, and after observing a fire outside of the airplane adjacent to the left side of the fuselage, kicked the baggage door located on the right side of the fuselage. They then helped rescue the middle seat occupants from the airplane, ran to the airport, and called for emergency assistance.

PERSONNEL INFORMATION

Information pertaining to the pilot is contained on page 3 of the Factual Report-Aviation. No determination could be made as to recent night flight experience required by 14 CFR Part 61.57. Additionally, according to the pilot who delivered the airplane to and flew with the new owner/accident pilot on two separate flights with the new owner acting as pilot-in-command, he had to help the accident pilot rotate and flare for landing on both flights. The accident pilot

had the tendency to rotate the airplane too late, the approach speed on final for both flights was 20 knots fast, and the flare for landing was late. The pilot further stated that both flights occurred during daylight hours and he did not observe the pilot using a checklist. He felt the accident pilot was not proficient in the accident make and model airplane and when he asked the accident pilot if he would like to perform airwork, the accident pilot responded that "he had someone else lined up." The accident pilot had accumulated an estimated 9 hours in the accident airplane since purchasing it in January 1996.

AIRCRAFT INFORMATION

Information pertaining to the airplane is contained on page 2 of the Factual Report-Aviation and in Supplements A and B. The aircraft and engine logbooks were reportedly in the airplane at the time of the accident. According to the Pilot's Operating Handbook and FAA approved Airplane Flight Manual (POH/AFM), the flight characteristics of the airplane are not affected if the cabin door becomes unlatched in flight; however, there is a reduction in performance. The airplane was equipped with a 136-gallon usable fuel supply according to the original delivery documents and one of the recent previous owners/operators.

A weight and balance document obtained from one of the two recent previous owner/operators of the airplane revealed an error in the empty weight and empty weight moment.

Weight and balance calculations were performed using the corrected empty weight and empty weight moment. The pilot's weight was based on FAA records and the weight of the right front seat passenger was based on a recent physical examination. The weights of the surviving passengers and their baggage, its location, and seating positions were based on interviews. The fuel tanks were determined to be full before takeoff. Additionally, the POH/AFM was consulted regarding fuel used for engine start, taxi, and takeoff which was included in the calculations. The takeoff weight and center of gravity (CG) were calculated to be 5, 658 pounds and 87.34 inches respectively using the above information, and most forward seating position of each of the first four seats which are movable. The accident weight and CG were calculated using an estimated fuel consumption of 61 gallons and the above information and determined to be 5,292 pounds and 87.56 inches respectively. According to the POH/AFM, the gross takeoff or landing weight is 5,100 pounds and the aft CG limit is 86.0 inches.

Weight and balance calculations for takeoff and landing were also performed using the incorrect empty weight and empty weight moment, and the identical information from above. The takeoff weight and CG were calculated to be 5,562.8 and 88.04 inches respectively. The accident weight and CG were calculated to be 5,196.8 and 88.31 inches respectively.

AERODROME INFORMATION

Information pertaining to the airport is contained on page 2 of the Factual Report-Aviation.

At the time of the accident the runway lights and the Visual Approach Slope Indicator (VASI) were on. The Airport Facility Directory indicates that the runway 3 safety area has a 100 foot drop off 100 feet from the threshold on both sides of the runway centerline. Also, the height at the departure end of the runway is 27.4 feet higher than the approach end of the runway. The airport is equipped with a localizer approach to runway 3 and the height of the localizer antenna is 10.38 feet higher than the height at the departure end of runway 3. The antenna which was not damaged during the accident sequence is located 830 feet from the departure end of the runway. The terrain drops about 110 feet at a distance of about 850 feet from the departure end of the runway and trees of varying heights are located beginning 960 feet from the departure end of the runway.

WRECKAGE AND IMPACT INFORMATION

Examination of the runway used revealed that there was no evidence of either propeller contacting the runway. Examination of the accident site revealed that the airplane first impacted trees while in a 10 degree right wing low attitude. The first airplane component found along the wreckage path was the right wing tip which was located about 1,036 feet from the departure end of the runway and about 25 feet to the right of the extended centerline. The airplane continued on a heading of about 040 degrees while in a 15-degree angle of descent colliding with trees of varying heights and diameters. Beginning about 1,514 feet from the departure end of the runway and to the right of the wreckage path were components from the left wing. The wreckage came to rest 1,560 feet from the departure end of the runway on a magnetic heading of 030 degrees with the left wing nearly separated and the cockpit and cabin inverted and consumed by fire. The empennage was upright. The left engine, left main and nose landing gears were separated from the airframe. The left engine propeller was separated from the engine and the main cabin door was also separated from the airframe. The aft and bottom pins were extended but were not deformed.

Examination of the aileron, elevator, and rudder flight controls revealed control cable continuity from each control surface to the cockpit section. The flaps were determined to be retracted and the landing gear actuator was determined to be retracted. There was no evidence of failure of the piston and fork assembly of the nose landing gear.

Examination of the left engine revealed that the propeller mounting studs were in place through the crankshaft flange holes. Crankshaft, camshaft, and valve train continuity and thumb compression were verified. The left magneto was attached to the engine only by the ignition leads and the right magneto was tight. The right magneto engine timing was determined to be 32 degrees after top dead center. No determination could be made as to the reason for the position of the magneto as found. Both magnetos produced spark when rotated by hand. Three of the six fuel injector nozzles were found plugged with a carbon like residue. All fuel injector lines from the fuel manifold to the injector nozzles were free of obstructions. The No. 5 cylinder fuel injector nozzle was not located. Damage to the top of the No. 5 cylinder was noted. The throttle at the servo fuel injector was full open and the mixture control was near the idle cutoff position. The engine driven fuel pump drive coupler was not failed.

The cover for the fuel distributor valve was opened and a black substance was observed underneath the diaphragm. A sample of the substance and the engine driven fuel pump were retained for examination and testing. (See tests and research section of this report.)

Examination of the left propeller revealed that the propeller mounting studs were pulled from the hub mounting flange. Two of the three blades were loose in the hub and all blades were found in the "feathered" position. Two of the three blade pitch change knobs were failed at the butt end of the blade and the remaining knob was failed at the radius for change in diameter. Examination of the fracture surfaces revealed evidence of overload failure. Examination of the propeller blades revealed two of the three blades were bent aft. The remaining blade was bent forward at a 90-degree angle about midspan on the blade. That blade also exhibited evidence of a slight forward bend at the blade tip. Examination of the leading edges of all blades revealed no evidence of gouges. The position of the propeller blades based on the position of the pitch change rod revealed a propeller blade angle of 20-21 degrees. The low pitch blade angle is 13.5 degrees + or - 0.1 degrees. Impact signatures on internal components of all three blades revealed evidence that the propeller blades were moved from a high blade angle position to a low blade angle position. Blade angles based on impact signatures from components located at the butt end of each blade were inconclusive.

Examination of the right engine revealed crankshaft, camshaft, and valve train continuity. Differential compression of cylinder Nos. 1-6 using 80 psi as a base revealed 65, 75, 72, 67, 74, and 66 psi respectively. Both magnetos were tightly secured but heat damage precluded determining magneto to engine timing. Both magnetos produced spark from each coil when rotated by hand. The throttle control was slightly less than midrange and the mixture control was near idle cutoff at the servo fuel injector. The engine driven fuel pump drive coupler was intact. The propeller governor was removed for examination which revealed that the pushrod was failed due to overstress.

Examination of the right propeller revealed that the pitch change mechanism was "on the start locks." When the stop sleeve was removed the propeller blades moved to the "feather" position. Two of the three blade pitch change knobs were not failed. The failed knob was examined with evidence of overload failure. Two of the three blades exhibited evidence of torsional twisting near the blade tips and the remaining blade was bent aft at about a 90-degree angle. Slight gouges on the leading edge of one of the three propeller blades were noted. Impact signatures indicate that the propeller blade angle was between 10 and 27-degrees. The low pitch blade angle is 13.5-degrees + or - 0.1 degree.

MEDICAL AND PATHOLOGICAL

Post-mortem examinations of the pilot and right front seat passenger were performed by Thomas B. Clark III, M.D., Pathologist, Office of the Chief Medical Examiner, Chapel Hill, North Carolina. The cause of death for the pilot was listed as thermal burns. The cause of death for the passenger was listed as multiple traumatic injuries sustained in plane crash.

Toxicological analysis was performed on specimens of the pilot only by the FAA Toxicology and Accident Research Laboratory. The results were negative for carbon monoxide, cyanide, ethanol, and tested drugs. The results were positive in muscle and urine for Verapamil, and Norverapamil. According to the pilot's medical records he was taking Isoptin (verapamil hydrochloride) which was approved by the FAA Aeromedical Certification Division, Civil Aeromedical Institute.

TESTS AND RESEARCH

Infrared analysis of the black substance found underneath the diaphragm of the left engine manifold assembly revealed it to be a hydrocarbon, lubricating oil-type material. A sample of an unused lubricating oil was heated in a laboratory which revealed that it matched in color and consistency with the substance found in the manifold valve.

The engine driven fuel pump was sent to the engine manufacturer's facility for further tests. Heat damage to the pump required replacement of the rear portion of the pump however the portion of the pump that contained the oil seals was retained. The pump was placed on an operable engine which was in a test cell. The engine was started and operated two times, the first for 25 minutes at 2,200 rpm and the second for 5 minutes at 2,650 rpm. After each run the engine was secured and the manifold cover was opened which revealed no evidence of oil contamination.

ADDITIONAL INFORMATION

The wreckage excluding the retained left engine driven fuel pump, left engine propeller and propeller governor, right engine propeller and propeller governor, and the pushrod from the right engine propeller governor was released to Mr. Richard Cloninger of Inflight Aviation International, Inc., on February 21, 1996. The left engine driven fuel pump, both engine propellers and both propeller governors were released to Mr. James T. Brewer of Inflite Aviation International on October 15, 1996. The retained pushrod from the right propeller governor was released to Mr. James T. Brewer, of Inflite Aviation International, on December 16, 1996.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 17, 1994
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	25000 hours (Total, all aircraft), 9 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N448P
Model/Series:	95-B55 95-B55	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	TC-2172
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 6, 1995 Annual	**Certified Max Gross Wt.:**	5100 lbs
Time Since Last Inspection:	89 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	2540 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed	**Engine Model/Series:**	IO-470-L
Registered Owner:	RAY DAVIS	**Rated Power:**	260 Horsepower
Operator:		**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:**	Night/dark
Observation Facility, Elevation:	HKY ,1189 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	20:55 Local	**Direction from Accident Site:**	118°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	3°C / -9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ST AUGUSTINE , FL (SGJ)	**Type of Flight Plan Filed:**	None
Destination:	(MRN)	**Type of Clearance:**	None
Departure Time:	18:35 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	MORGANTON-LENOIR MRN	**Runway Surface Type:**	Asphalt
Airport Elevation:	1266 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	3	**IFR Approach:**	None
Runway Length/Width:	4000 ft / 75 ft	**VFR Approach/Landing:**	Go around;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal, 1 Serious, 3 Minor	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal, 1 Serious, 3 Minor	**Latitude, Longitude:**	35.739109,-81.690078(est)

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	MITZI HOLLOMON; CHARLOTTE , NC JAMES E STERMER; WICHITA , KS DALE CARTER; MARIETTA , GA ROGER W STALLKAMP; PIQUA , OH
Original Publish Date:	April 29, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=37896