National Transportation Safety Board
Aviation Accident Final Report

Location:	CHARLOTTE, NC	**Accident Number:**	ATL98FA023
Date & Time:	12/10/1997, 2321 EST	**Registration:**	N30SA
Aircraft:	Beech A100	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

Following a missed approach at the destination, the pilot requested weather information for two nearby airports. One airport was 53 miles northeast with a cloud ceiling of 900 feet, and visibility 6 miles. The pilot opted for the accident airport, 21 miles southwest, with an indefinite ceiling of zero, & visibility 1/4 mile. After completing the second missed approach, the flight proceeded to the accident airport. Radar vectors were provided to the ILS runway 36L. On the final approach, the flight veered to the right of the localizer and descended abruptly. Last recorded altitude for the flight was below the decision height. Investigation revealed no anomalies with the airport navigational aids for the approach, and the airplane's navigation receivers were found to be operational. Postmortem examinations of the pilot did not reveal any pre-existing diseases, and toxicological examinations were negative for alcohol & other drugs.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's continued approach below decision height without reference to the runway environment, and his failure to execute a missed approach.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (F) WEATHER CONDITION - FOG
2. (F) WEATHER CONDITION - LOW CEILING
3. (C) DECISION HEIGHT - NOT COMPLIED WITH - PILOT IN COMMAND
4. (C) MISSED APPROACH - NOT PERFORMED - PILOT IN COMMAND
5. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On December 10, 1997, about 2321 eastern standard time, a Beech A100, N30SA, collided with trees and the ground during an instrument landing system [ILS] approach to runway 36L at the Charlotte/Douglas International Airport, Charlotte, North Carolina (CLT). The airplane was operated by Spitfire Sales and Leasing, Inc. under the provisions of Title 14 CFR Part 91, and instrument flight rules [IFR]. Instrument meteorological conditions prevailed. An IFR flight plan was filed for the business flight. The airline transport pilot was fatally injured, the passenger was seriously injured, and the airplane was destroyed. Origination of the flight was Lewisburg, West Virginia, about 2200, on the same day, with a destination of Concord, North Carolina.

At 2109, a person who identified himself as thirty sierra alpha (N30SA) contacted the Elkins, West Virginia Automated Flight Service Station (Elkins AFSS) preflight desk by telephone, and requested the Charlotte, North Carolina, weather and to file an IFR flight plan to Concord. The caller indicated that a takeoff from Lewisburg was planned for 2315, with an estimated time to Concord of 35 minutes. The caller stated the airplane had 2.5 hours of fuel.

At 2157, N30SA was cleared by air traffic control for the flight from Lewisburg to Concord.

The flight proceeded to Concord where two missed approaches were flown. After the first missed approach the pilot requested and was provided the ceiling and visibility at Charlotte, and Greensboro, North Carolina, located 21 Nmi southwest and 53 Nmi northeast of Concord, respectively. The controller reported the Charlotte weather to N30SA as visibility 1/4 mile in fog, indefinite ceiling zero, temperature and dew point eight degrees C., runway 36L touch down runway visual range (RVR) of 2,000 feet, with runway 36R RVR more than 6,000 feet. The controller requested the ceiling and visibility from Greensboro, and was told it was 900 overcast and six miles. The controller then reported the Greensboro ceiling and visibility to N30SA as 500 and six. Following the second missed approach at Concord, N30SA requested clearance to Greensboro. After receiving the clearance to Greensboro, N30SA requested the current weather at Charlotte and was told the RVR for runway 36R was 2,800 feet, and visibility 1/8 mile in fog. According to the transcript of communications, at 2300, N30SA stated to the controller; "ah Charlotte would be easier for us Charlotte would be easier for us if ah you got some guys getting in there." The controller responded to the effect that people were landing at Charlotte. The pilot then requested to proceed to Charlotte.

The flight was vectored for an approach to runway 36L, at CLT. According to the communications transcript, N30SA was to follow a Boeing 737 to runway 36L, with a Learjet between them landing on runway 36R. When the flight contacted the Charlotte Tower, the controller informed the pilot that he was cleared to land on runway 36L, following a 737 at four miles, the wind was calm, and the touchdown runway visual range was 1,800 feet.

The president of the company operating N30SA, also an airline transport pilot with multi engine rating, was in the cabin of the airplane and provided the following information. Following the first missed approach at Concord, he leaned into the cockpit and offered the pilot assistance. He assisted by handling the radio transmissions, and reviewed the essential elements of the approach with the pilot. He returned to his seat in the cabin. As the airplane neared decision height on the second approach, he looked into the cockpit and saw no ground

references. During the missed approach climb he noted that the fog was thick and patchy. The pilot indicated the flight would proceed to Charlotte. At some point, he reviewed the runway 36L approach information. During the completion of the approach checklist to Charlotte, he noted that he fuel quantity indicated 1,400 pounds. Charlotte Tower cleared the flight to land behind a 727 or 737, and cautioned them of wake turbulence. He kneeled on the floor and noted they were trailing a large airplane. The situation looked good and he sat back down in the cabin, closed his brief case, then strapped into the seat on the right side of the airplane, where he was looking into the cockpit. He felt the airplane make a right turn, then looked into the cockpit and saw a full scale deflection of the course deviation indicator and the altimeter indicating 800 or 900 feet. He yelled go-around, didn't recall if power was added, and heard something hit the left side of the airplane. Subsequently, he awakened laying in the woods, and looked at the wreckage.

Radar data indicated that an ILS approach to runway 36L was executed. At 2116:49, according to the communications transcript, N30SA was cleared for the approach, to which the flight responded "thank you." At 2321:12, the controller requested N30SA to verify position. The controller received a response from an unknown source, "stating three six left." There was no further radio contact with the airplane. Radar data indicated that the last radar contact with N30SA was at 2320:47, at 800 feet mean sea level, about 1.5 miles south of the airport. At 2328:04, the east departure controller stated to the local controller " ah the ah that kingair right at the end went toward the right you know he kind dove towards three six right you know." Weather conditions at the time included fog, with runway 36L runway visual range of 1800 feet. The airplane collided with trees, along a magnetic heading of about 013 degrees, and came to rest between the parallel runways, about 0.2 miles from the end of runway 36R.

PERSONNEL INFORMATION

The pilot held airline transport pilot certificate number 1715590, with airplane multiengine land rating. He had type ratings in the Learjet, Canadair Challenger, Israel Jet, Cessna Citation, Falcon 20, and the DeHavilland DH-125. He held commercial privileges in single engine land airplane and helicopter. He was also a certificated flight instructor, with airplane single engine, multi engine, and instrument ratings. His last medical was a first class, issued on June 22, 1997, with the limitation that the holder must possess lenses for near vision while exercising the privileges of this airman certificate.

Spitfire Aviation, Inc hired the pilot on November 3, 1997. Pilot records, provided by the operator, indicated that the pilot completed his initial training on November 18, 1997. His flight training with Spitfire Aviation, Inc was accomplished in the Mitsubishi MU-300 and the Beech 200. A flight check was completed as second in command in the MU-300, under Title 14 CFR Part 135.293, 135.297, and 135.299 on November 7, 1997.

According to the records provided by the operator, the pilot listed his flight hours as of June 6, 1997, as follows:

Total time	13,949	Total jet hours	5,245
Total helicopter	375	Previous 12 months	180 Learjet
Previous 90 days	110 Learjet	Total instrument hours	2798
Total night hours	3302		

The operator's records indicated that as of October 31, 1997 the pilot had 14,320 flight hours, with 350 hours in turboprop aircraft. Between November 11, 1998 and December 9, 1998, the operator reported, the pilot had 27.4 total hours with 15.1 hours in the Beech 200 and 12.3

hours in the Beech 100. During the same period the pilot had 3.3 flight hours in instrument conditions, and 4.6 hours at night. Two point six of the night hours were under instrument conditions. The operator also noted that on December 9, 1997, the pilot had completed an ILS approach in deteriorating weather conditions as part of his training.

Additional pilot information is contained in this report on page 3, under the heading First Pilot Information.

AIRCRAFT INFORMATION

The airplane, N30SA, was a Beech A100, serial number B246. It was certificated in the Normal Category and was operated during the flight under the provisions of Title 14 CFR Part 91. The airplane was powered by two Pratt and Whitney PT6A-28A turboprop engines, fitted with two Hartzell HC-B4TN-3A propellers.

The airplane was approved for operation under the operator's Title 14 CFR Part 135 Operating Certificate. Visual flight rules, IFR, day, and night operations were approved. The Operations Specifications issued by the FAA to the operator specified that the airplane could be used in Part 135 operations provided the additional maintenance requirements of Section 135.421 were met: engine overhaul after 3,500 hours time in service, propeller overhaul after 3,000 hours/ 60 calendar months time in service. According to records provided by the operator, the airplane was maintained under an approved aircraft inspection program, which was the manufacturer's inspection program. According to the operator's report of the accident, the airplane had 6,573.6 total flight hours and 3,093.7 hours since overhaul of the engines. The operator's reported hours were consistent with the aircraft record. According to the logs, the propellers' times since overhaul were 759 hours.

A flight log was found in the wreckage that indicated that on December 10, 1997, the airplane had flown 1.1 hours from Concord to Lewisburg, and consumed 700 pound of fuel. The log also indicated that an ILS approach was executed at Lewisburg.

According to the airplane log, the airplane was weighed on June 5, 1997, due again in 36 months. Entries in the airplane log indicated that the altimeter and pitot static system, and the transponder were inspected on March 6, 1996.

Additional aircraft information is contained in this report on page 2, under the heading Aircraft Information.

METEOROLOGICAL INFORMATION

The meteorological report for Charlotte at 2314 on December 10, 1997, was as follows: wind 240 at three knots; visibility one quarter of a mile, runway 36L RVR 2,400 feet, fog; indefinite ceiling zero; temperature/dew point eight degrees centigrade; altimeter 29.79.

At 2328, on the same day, the special Charlotte weather report was as follows: wind 260 at three knots; visibility one eighth mile, runway 36L RVR 1,800 feet variable 2,400 feet, fog; indefinite ceiling zero; temperature/dew point eight degrees centigrade; altimeter 29.79.

Additional weather information is contained in this report on page 4, under the heading Weather Information.

AIDS TO NAVIGATION

Runway 36L at the Charlotte/Douglas International Airport was served by an instrument

landing system with outer, middle, and inner markers. The Localizer (LOC) provided lateral guidance for a precision instrument approach to the runway, with a frequency of 111.7 MHz. The final approach course was 001 degrees, magnetic. A glide slope (GS) was present providing horizontal guidance to the runway. Approach lights were Approach Lighting System Configuration II with sequenced flashing lights leading to the runway centerline. The runway was also equipped with Touch Down Zone lights and Centerline lights. The visibility minimum for the approach was 1,800 feet RVR, and the decision height was 908 feet MSL.

On December 11, 1997, the components of the runway 36L ILS were checked and recertified, without corrections, by Airways Facility personnel at the Charlotte Airport.

Additionally, the Facility Maintenance Logs and Technical Performance Records of the runway 36L ILS for the previous two weeks were reviewed (attached). There were no discrepancies reported that affected the technical performance of the approach system.

On December 12, 1997, the runway 36L ILS at Charlotte was flight inspected. According to the report of the inspection, the facility operation was found satisfactory.

WRECKAGE AND IMPACT INFORMATION

The airplane collided with trees in a wooded area, then came to rest in a kudzu clearing, about 0.2 miles south of the Charlotte Douglas International Airport, between the extended centerlines of runways 36L and 36R. From a helicopter over the accident site, broken trees were observed along a magnetic azimuth of about 011 degrees. Wreckage debris was scattered through the kudzu clearing leading from broken trees to the main wreckage along a magnetic azimuth of 007 degrees.

On the ground, under the first broken tree that was found south of the main wreckage, blue and white paint chips were discovered that matched the colors on the airplane. Continuing north along the debris path, airplane pieces from the left wing and the nose area were located on the ground beneath the tree limbs. A three foot section of the left aileron, the left wingtip, the tip of the right wing, and a 1.5 foot section of the left wing with fuel bladder material were all found along the debris trail, on the ground beneath the broken trees. A section of the left aileron was also observed hanging in the tree limbs. The overall length of the debris trail was about 200 yards.

At the south edge of the kudzu clearing, the radar antenna from the nose of the airplane, the outboard section of the left wing, and the upper three fourths of the vertical stabilizer were located, about 50 yards south of the main wreckage. The separated right propeller and the separated right reduction gear box were found about 25 yards south of the main wreckage. The separated rudder and left elevator were located adjacent to the left side of the nose of the fuselage. The separated left propeller and engine exhaust section were located north of the main wreckage, forward of the right wing. The left engine, aft of the C flange was found beside the left side of the empennage, while the right engine aft of the C flange was under the right wing.

The nose of the airplane was crushed aft and displaced toward the left. The left cockpit wall and window had been pulled away, as well as the top of the cockpit, exposing the pilot's compartment. The fuselage was broken open, circumferentially, from the top of the left wing over the top of the fuselage to the top of the right wing, through the emergency exit windows. The rear edge of the main cabin door, from top rear corner through the fuselage at the lower rear corner of the door, was crushed inward beyond the rear door frame. Interior furnishings

had broken loose and were displaced throughout the cabin.

The empennage had been pulled away from the fuselage and was attached by the control cables. The left horizontal stabilizer tip was absent, and the leading edge beginning at the tip rib and continuing to the midpoint was curled up. The leading edge was separated from the stabilizer spar from the tip past the mid span point. The left elevator was separated with the pitch bearing pulled aft out of the bearing support. The left elevator tip counterweight was found along the wreckage debris trail. The vertical stabilizer upper three fourths had been cut off with the dorsal fin exhibiting a circular concave indentation. The rudder was pulled away from the vertical stabilizer with the leading edge exhibiting similar concave indentations. The rudder lower support and control horn was broken away consistent with the top of the rudder having been broken off rearward.

The left wing was sheared off about four feet outboard of the left engine. At the point of separation, the leading edge was flattened, vertically with concurrent accordion like crushing. A second impact site that split open the leading edge, vertically, was observed just inboard of the stall fence. A concave circular indentation was noted at the left wing root. The left propeller and engine, forward of the C flange, was separated from the engine. The propeller blades of the left propeller all exhibited muddy residue and chordwise scuffing. Two blades were bent 90 degrees, along a chord line, about the midpoint of the deice boot, with additional "S" shaped bending outboard of the 90 degree bend. The third and fourth blades exhibited "S" curve shaped damage, spanwise, and twisting along the span toward a lower pitch. The left nose cone was crushed around the propeller dome, as if squeezed from the sides. Burned leaves were found beneath the left engine exhaust section.

The right wing was separated along a chord line between the aileron and flap. It remained attached by the aileron cable. There was upward and aft crushing of the right wing leading edge. The right engine and firewall were pulled off of the wing, exposing the nacelle fuel bladder. All of the right propeller blades exhibited muddy residue and chordwise scuffing on the blade backs. One blade was bent 180 degrees, along a chord line, about 12 inches inboard from the tip. A second blade was bent 90 degrees, along a chord line, bout half way outboard of the deice boot. The third and fourth blades exhibited "S" curve bending and twisting toward a lower pitch. The propeller spinner was smeared with mud and twisted around the propeller dome, as if the propeller was rotating as the nose of the spinner penetrated into the ground.

Both main landing gear were extended and broken forward. The nose gear was found, separated from the airplane, in the kudzu clearing adjacent to the left wing outboard-section, and vertical stabilizer. The flaps were found extended to the approximate approach position. There was continuity of the control cables to the empennage section, where the rudder was broken free of the mechanical connections, and the left elevator was separated from the root mechanical connection. The outboard section of the right wing was connected by the aileron cable. The stabilizer trim actuator was extended 5.8 inches, consistent with approximately five degrees nose up trim.

MEDICAL AND PATHOLOGICAL INFORMATION

A post mortem examination of the pilot was performed by the Mecklenburg County Office of the Medical Examiner 618 North College Street Charlotte, North Carolina 28202.

Toxicological examinations of the pilot were conducted by the Toxicology and Accident Research Laboratory, FAA. The report of the examinations was negative for ethanol and other

drugs.

TESTS AND RESEARCH

Both engines were sent to the manufacturer's facility in Longueuil, Quebec for disassembly and inspection. A report of the inspection is attached. Both engines exhibited case distortion and impact loading with concurrent internal rotating component rubbing and machining. Additionally, there was evidence of axial shifting of internal rotating components and associated circumferential rubbing.

The course deviation indicator, Horizontal Situation Indicator (HSI), and both localizer receivers were removed and forwarded to the manufacturer's facilities for examination. Reports of the examinations are attached. A wire for the Distance Measuring Equipment (DME) was chafed although the distance was properly presented during the test. A segment of the DME display for the tenths numeral was burned out which would have provided erroneous read out for the numbers 2-9 if failed in flight. The glide slope indicator would only move up, however, the up and down meter springs were found entangled. When untangled following the test, the glide slope needle move appropriately. Bench testing of the LOC receiver fitted with marker beacon feature was found to have a failed Crystal A4Y101, which resulted in all channels associated with 110 MHz being non functional. The LOC frequency at Charlotte was 111.7 MHz. The effect of the failure could have been an open circuit failure, or a shorted circuit. With an open circuit failure the LOC would have been operational on 111.7 MHz. A shorted circuit failure of the crystal would have resulted in an "off" flag being displayed, and the LOC needle would have centered.

Recorded radar data was obtained from the Charlotte Tower. At 2318, the radar data depicted the target for N30SA crossing the final approach fix at 2,800 feet msl, on course, with a heading of 001 degrees magnetic. Shortly after crossing the final approach fix, the heading and course began deviating to the right, continuing to deviate right to 013 degrees, and until radar contact was lost. Between 2320:05 and 2320:38, the radar data depicted a descent of 300 feet, with a descent rate of about 545 feet per minute. Between 2320:05 and 2320:47, the radar data depicted a descent of 700 feet, with a descent rate of about 1,000 feet per minute. From 2320:33 to 2320:47, the last 16 seconds of the flight, the radar data depicted a descent of 400 feet, with a descent rate of approximately 1,700 feet per minute.

ADDITIONAL INFORMATION

The aircraft records for the airplane were returned to the president of Spitfire Aviation, Rob Combs, 9200 Aviation Blvd Concord, North Carolina 28027. The wreckage was release to the insurance representative for Inflite Aviation, James T. Brewer 100 North Tryon Suite B 220-201 Charlotte, North Carolina 28202.

Pilot Information

Certificate:	Airline Transport	**Age:**	52, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last Medical Exam:**	06/22/1997
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	14320 hours (Total, all aircraft), 27 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Beech	**Registration:**	N30SA
Model/Series:	A100 A100	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	B246
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	10/14/1997, AAIP	**Certified Max Gross Wt.:**	11868 lbs
Time Since Last Inspection:	23 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	6575 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-28
Registered Owner:	SPTIFIRE SALES AND LEASING,INC	**Rated Power:**	700 hp
Operator:	SPTIFIRE SALES AND LEASING,INC	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	S1FA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	CLT, 749 ft msl	**Observation Time:**	2328 EST
Distance from Accident Site:	2 Nautical Miles	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Temperature/Dew Point:**	8°C / 8°C
Lowest Ceiling:	Obscured / 0 ft agl	**Visibility**	0.4 Miles
Wind Speed/Gusts, Direction:	3 knots, 260°	**Visibility (RVR):**	1800 ft
Altimeter Setting:	29 inches Hg	**Visibility (RVV):**	0 Miles
Precipitation and Obscuration:			
Departure Point:	LEWISBURG, WV (LWB)	**Type of Flight Plan Filed:**	IFR
Destination:	CONCORD, NC (JQF)	**Type of Clearance:**	IFR
Departure Time:	2200 EST	**Type of Airspace:**	Class B

Airport Information

Airport:	CHARLOTTE/DOUGLAS INTL (CLT)	**Runway Surface Type:**	Concrete
Airport Elevation:	749 ft	**Runway Surface Condition:**	Wet
Runway Used:	36L	**IFR Approach:**	ILS
Runway Length/Width:	10000 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	PRESTON E HICKS	**Adopted Date:**	11/10/1998
Additional Participating Persons:	MITZI HOLLOMAN; CHARLOTTE, NC RON PRICE; WASHINGTON, DC REGAN CAMPBELL; ATLANTA, GA		
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/.		

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