National Transportation Safety Board
Aviation Accident Final Report

Location:	RALEIGH, NC	**Accident Number:**	MIA00FA229
Date & Time:	07/31/2000, 0034 EDT	**Registration:**	N201RH
Aircraft:	de Havilland DHC-6-200	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal, 1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The flight had proceeded without incident until a visual approach was made to the destination airport, but a landing was not completed because of poor visibility due to ground fog. The pilot then requested vectors to another airport, and was advised by ATC that he was below radar coverage, and he could not be radar identified. The pilot stated he would proceed to a third airport; he was given a heading, instructed to proceed direct to the airport, and report the field in sight. He was told to over-fly the airport, and might be able to descend through a clearing in the clouds. An inbound air carrier flight reported instrument meteorological conditions on the final approach to a parallel runway. At a location of 1.13 miles east of the airport, the flight, for no apparent reason, turned south, away from the airport. The last radio contact with pilot was after ATC told him his heading was taking him away from the airport and he said he was turning back. The last known position of N201RH was 1.95 miles southeast of the airport, at 500 feet MSL. According to the statement of the passenger that was sitting in the co-pilot's seat, "...all we could see were city lights and darkness underneath us. We were in a right turn, when I saw the trees and subsequently hit it." According to the pilot's log book and FAA records revealed a limitation on his commercial pilot certificate prohibited him from carrying passengers for hire at night and on cross-country flights of more than 50 nautical miles. The records did not show any instrument rating. As per the entries in his personal flight logbook, he had accumulated a total of 1,725.2 total flight hours, 1,550.9 total single engine flight hours, and 184.3 total flight hours in multi-engine aircraft of which 145.6 hours were in this make and model airplane. In addition, the logbooks showed that he had a total of 487.3 cross country flight hours, 61.9 total night flight hours, and 21.6 simulated instrument flight hours.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's continued VFR flight into IMC conditions, by failing to maintain altitude, and descending from VFR conditions into IMC, which resulted in him subsequently impacting with trees. Factors in this accident were: reduced visibility due to dark night and fog. An additional factor was the pilot was not certified for instrument flight.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) WEATHER CONDITION - FOG
3. (C) VFR FLIGHT INTO IMC - CONTINUED - PILOT IN COMMAND
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
5. (F) LACK OF CERTIFICATION - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: MANEUVERING - TURN TO REVERSE DIRECTION

Findings
6. OBJECT - TREE(S)
7. TERRAIN CONDITION - ROUGH/UNEVEN

Factual Information

HISTORY oF FLIGHT

On July 31, 2000, about 0034 eastern daylight time (all times are EDT unless otherwise indicated), a DeHavilland Canada DHC-6-200, N201RH, registered to Win Win Aviation Inc., impacted with trees while maneuvering for a landing at the Raleigh-Durham International Airport (RDU), Raleigh, North Carolina. Instrument meteorological conditions prevailed at the time. A visual flight rule (VFR) flight plan was filed for the 14 CFR Part 91 positioning flight. The airplane was destroyed. The commercial-rated pilot received fatal injuries. Two passengers reported serious injuries. The flight had departed Hinckley, Illinois, en route to Louisburg, North Carolina, about 1910 central daylight time (CDT).

According to a surviving passenger, the purpose of the flight was to bring the airplane to a maintenance facility at Louisburg, to have maintenance performed on the engines. A visual approach was made at Louisburg, but a landing was not completed because of poor visibility due to ground fog. According to the statement of the passenger that was sitting in the co-pilot's seat, "...after trying unsuccessfully to land at 00NC and Franklin County Airport. We were trying to locate RDU. All we could see were city lights and darkness underneath us. We were in a right turn, when I saw the trees and subsequently hit it. I was knocked out for a second and then found myself hanging in the [seat] harness. I undid it and exited the aircraft."

The female passenger was asleep on the floor at the rear of the cabin, there were no seats, and woke up after the impact outside the airplane on the ground.

According to the Air Traffic Control (ATC) summary of flight, at 1053 CDT the pilot of N201RH called the Kankakee AFSS (Automated Flight Service Station) via telephone and requested and received the current local conditions for a skydiving flight at the Hinkley Airport (0C2). The pilot then requested and received an outlook weather briefing for a VFR flight to the Raleigh-Durham Airport (RDU) leaving around 1800 to 2000 CDT. At 1814 CDT, the pilot of N201RH again called the Kankakee AFSS and requested and received a standard weather briefing for a VFR flight from 0C2 airport to 00NC (North Raleigh) airport departing around 2000 CDT. The surface weather at RDU at 1751 CDT, 23 minutes before the pilot called the AFSS, was reported to have been; winds from 130 degrees, at 5 knots; visibility 10 statute miles; sky conditions, FEW 200 feet, scattered 2,000 feet, broken 20,000 feet; temperature 79 degrees F; Dew point 73 degrees F; and the altimeter 30.35 in Hg. There were no SIGMETS (Significant Meteorological Advisory) for convective activity in the area of RDU, and there were no AIRMETS (Airman's Meteorological Information Network) for turbulence or icing outside convective activity for the area. The pilot received the briefing and then filed a VFR flight plan, which was received and filed by the specialist. At 1913 CDT, the pilot of N201RH called the Kankakee AFSS in-flight one position via radio and activated his VFR flight plan to 00NC and verified three people on board.

The flight continued without incident, and at 0000:15, the pilot of N201RH made initial radio contact with the FAA, Raleigh Approach Control, 37 miles north northwest of RDU at 9,500 feet. He was subsequently instructed to descend VFR at pilot's discretion, report North Raleigh Airport in sight, and he acknowledged. At 0015:47, the pilot reported North Raleigh insight, he was provided the RDU ceiling conditions, radar service was terminated, and a frequency

change was approved. About 4 minutes later at 0019:29, the pilot of N201RH re-established contact with the FAA, Raleigh Approach Control, advised that he was unable to land at North Raleigh due to fog, and requested vectors to the Franklin County (LHZ) Airport. The controller advised the pilot that he was below RDU ASR-9 radar coverage, he could not be radar identified, and that they were unable to provide him with general directional guidance to assist in locating LHZ. The pilot stated he would proceed to RDU. The pilot was issued a local discreet beacon code, radar identified at 3,500 feet MSL (mean sea level), heading 243 degrees direct to RDU. At 0027:18, the pilot was advised to descend VFR at pilot's discretion to 2,000 feet; the airport was 12 o'clock and 12 miles. He was instructed to over-fly RDU at 2,000, and the pilot of N201RH responded that he would comply.

The recorded radar data from the FAA, Raleigh Approach Control showed the flight was observed on radar at 0032:21, 1.5 miles east of RDU, at 1,000 feet MSL, heading 243 degrees direct RDU at 121 knots. At 0032:39, 1.13 miles east of RDU, at 900 feet MSL, heading 179 degrees (left turn to the south), away from the airport, at 114 knots. At 0033:16, 1.6 miles east southeast of RDU, at 700 feet MSL, heading 179 degrees, at 89 knots. At 0033:30, 1.86 miles southeast of RDU, at 600 feet MSL, heading 179 degrees at 88 knots. At 0033:35, the last known position of N201RH was 1.95 miles southeast of RDU, at 500 feet MSL (about 100 feet above ground level), heading 206 degrees at 88 knots.

The following communications between the pilot of N201RH, and the FAA, Raleigh ATCT (air traffic control tower), Cab Coordinator (CC) were taken from the ATC transcripts. These conversations took place after the pilot had re-established radio contact with ATC, after realizing that he could not land at LHZ.

The pilot of N201RH was told he was radar contact, to proceed direct to RDU, report the airport in sight, and maintain VFR. The controller asked him, "...are you I F R qualified sir." The pilot answered, "...negative sir." The controller said, "...right we're still showing five hundred scattered...calling for five hundred broken...we'll uh run you over the top of the airport maybe you'll get it in sight." The FAA, ATCT Cab Coordinator contacted the pilot of American Airline's flight 1804 (AA1804), and said; "...I got ah VFR trying to get in here do you have the airport in sight." The pilot of AA1804 answered, "...sir it is i m c [instrument meteorological condition]." This information was past on to the pilot of N201RH. ATC told the pilot, they did not know if there were any breaks in clouds, but for now the field was "still v f r." The pilot was given the option to over fly the airport and if he did not get it in sight, he could be given vectors towards Chapel Hill, North Carolina. For unknown reasons, the airplane turned left to a southerly heading away from the airport, and the FAA, ATCT Cab Coordinator asked the pilot what his heading was, and the pilot answered, "...one eighty." He was again told to maintain "two thousand feet VFR," and the pilot said that he was "…..below the cloud cover," and "did not " have the airport in sight. ATC asked him to say his intensions, and he answered, "...we're gonna continue inbound to the airport sir." He was told that a heading of 180 degrees was leading him "away from the airport," and the pilot answered, "we're turning back towards it now sir." This was the last radio transmission from N201RH. (See the FAA, Transcription of Voice Recordings, an attachment to this report.)

For the next 31 seconds ATC made five attempts to re-establish contact with negative results. Due to low cloud cover, aircraft could not attempt a search and rescue. At 0340, search and rescue ground crews confirmed the location of the crash site.

The accident occurred during the hours of darkness about 35 degrees, 50 minutes north, and

078 degrees, 45 minutes west.

PERSONNEL INFORMATION

The pilot, age 45, held a FAA commercial pilot certificate, with airplane single engine land, airplane multiengine land, last issued on April 27, 2000, when the commercial airplane single engine land rating was added. The pilot held a FAA class 2 medical certificate issued on September 29, 1999, with no limitations. The pilot received a biennial flight review, as required by 14 CFR Part 61, on April 21, 1999. According to the pilot's log book, and FAA records, as of July 29, 2000; a limitation on his commercial pilot certificate prohibited him from carrying passengers for hire at night and on cross-country flights of more than 50 nautical miles. The pilot received his private pilot, airplane single engine land rating April 30, 1987. He was issued his commercial airplane multi-engine land rating July 30, 1992. The records did not show any instrument rating. As per the entries in his personal flight logbook, he had accumulated a total of 1,725.2 total flight hours, 1,550.9 total single engine flight hours, and 184.3 total flight hours in multi-engine aircraft of which 145.6 hours were in DHC-6 airplanes. In addition, the logbooks showed that he had a total of 487.3 cross country flight hours, 61.9 total night flight hours, and 21.6 simulated instrument flight hours.

An employee at Chicagoland Skydiving, the pilot's employer, was contacted in order to obtain information about the pilot's schedule at the airport on July 29-30, 2000. According to the employee, on July 29, 2000, the pilot flew about 6.5 hours of flying time. He had arrived for work at the airport around 7:00 a.m. (CDT), on that morning, and would have left work around 8:30 p.m. (CDT). In addition, she stated that he probably began flying between 8:00 and 9:00 a.m. (CDT).

The employee stated that the pilot only flew 3 loads, about 1 hour, on July 30, 2000, due to bad weather in the area. The pilot probably showed up at the airport around 7:00 a.m. (CDT), as he was an early riser. She stated he probably departed for North Carolina, around 7:30 p.m. (CDT), but could not confirm the time, because she had already left the airport by that time. She stated that the pilot had just begun working the weekend schedule about 2 weeks before the accident. This would have had him working Thursday through Sunday, with Monday through Wednesday off. In addition, the employee stated, that it was the pilot's choice to fly on Sunday evening, and that the owner of the company told her that he had given the pilot the choice of flying Sunday evening or Monday morning. According to what she was told by the owner, the pilot felt comfortable flying on Sunday evening.

AIRCRAFT INFORMATION

The airplane was a DeHavilland Canada, Inc., model DHC-6-200, serial number 163, manufactured in 1968. At the time of the accident the airplane had accumulated 28,711 total flight hours. The airplane received an annual inspection on July 6, 2000, 21.5 flight hours before the accident. The airplane was equipped with two Pratt and Whitney Canada PT6A-27, 620 horsepower engines. The left engine was overhauled 3,522.5 flight hours before the accident. The right engine logbooks did not show any overhaul information.

Based on DeHavilland Canada, Inc., factory build records, Twin Otter, s/n 163, was equipped with pneumatically operated pilot and co-pilot attitude and direction indicators. The flight instrument bleed-air system is tapped directly from the bleed-air ports of the left and right engines, upstream of the bleed-air valves. Each air line includes a restrictor to control volume. Each source is then filtered, dried, pressure-regulated, and supplied to individual manifolds for

the pilot and co-pilot instruments. The factory records indicate that aircraft s/n 163 was not equipped with engine-driven air pumps when it was delivered to the customer in September of 1968. No air pumps were found on the airplane.

METEOROLOGICAL INFORMATION

The reported weather at RDU at 0033 was; broken 500, visibility 6 sm, winds were from 140 degrees at 6 knots, temperature 73 degrees F, dew point 73 degrees F, and the altimeter was 30.08 inches Hg.

The pilot was informed by ATC, while on approach, that the reported weather at RDU was "five hundred scattered" and was soon expecting a special weather observation to indicated five hundred broken.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted in a heavily wooded area about 2 miles southeast of the Raleigh-Durham Airport, on the property of the William B. Umstead State Park, at an elevation of about 400 feet. The trees in the area were about 75 to 80 feet above the ground. The airplane came to rest nose down, heading in a northerly direction, with the fuselage remaining together. The airplane came to rest on the left side almost upside down. A piece of the right wing had separated and was found about 300 feet southeast of the wreckage. The left wing had separated and was found forward of the wreckage. There was an absence of fuel on the ground, in addition, to absences of the smell of fuel, at the crash site, and the fuel tanks were not breached. All components of the airplane, which are necessary for flight, were located along the crash path.

Due to the unstable position of the airplane after it had come to rest, access to the cockpit and cabin was considered unsafe. The wreckage was removed from the crash site and taken to the facilities of Atlanta Air Salvage, Griffin, Georgia, and further examination was conducted on August 29, 2000.

The lower forward flight compartment from about station 110.0 forward had remained together. Movement checks of the control column, rudder pedal mechanism and under-floor cables indicated that the primary control systems, elevator, ailerons, and rudder control cable were in place and operated correctly.

The salvage crew did not find any fuel in the tanks, or the smell of fuel on the ground, when the airplane was removed from the crash site. Examination of the cockpit fuel quantity gauges revealed that they were damaged, but readable, and indicated that the aft fuel tank was showing 300 pounds, the forward fuel tank 0 pounds. Due to extensive structural wire damage, an electrical function check of the fuel quantity system was not possible.

External inspection of the fuel system did not reveal any breaches in the fuel system. However, the salvage company had to cut the left and right main engine fuel feed lines in order to assist them in transporting the airplane. An accurate assessment of fuel remaining at the time of impact was not possible.

The cockpit engine ignition switch was found in the "NORMAL" position. The fuel selector switch was found on the "NORMAL" position. The forward and aft fuel tank boost pumps were found in the "ON" positions. According to the Aircraft Flight Manual, these positions would be in accordance with "Normal Procedures."

Both engines were disassembled at the facilities of Pratt and Whitney Engine Services, Atlanta, Georgia, on August 17-18, 2000.

The teardown revealed that the left engine displayed minimal impact damage and no fire damage. The compressor first stage blades and shroud, the power turbine hub spigot and interstage baffle inner cup, and the power turbine blade tips and shroud, displayed circumferential rubbing and scoring due to their making radial contact under impact loads.

Teardown of the right engine revealed impact damage, including complete structural separation of the gas generator case and accessory gearbox. No fire damage was observed. The compressor first stage blades and shroud, the compressor turbine blades and shroud, and the power turbine blades and shroud, displayed circumferential rubbing and scoring, due to their making radial contact under impact loads, and external housing distortion. The compressor turbine disc and the power turbine guide vane ring displayed circumferential rubbing due to axial contact under impact loads and external housing distortion.

Both engine fuel filters were disassembled and revealed that clean fuel was present in the left and right engine fuel filter bowls.

The left engine accessory gearbox was found in place. The fuel pump and fuel control assembly was fractured from the mounting pad, and held in place by lines. The fuel to oil heater and starting fuel control was found fractured from their mounts. The ignition exciter and Ng tachometer generator were found in place. The right engine accessory gearbox gears rotated freely by hand. The gearbox was not disassembled.

It was concluded that both engines displayed contact signatures to their internal components characteristic of both engines developing power at impact. The teardown of both engines did not reveal any discrepancies. (See the Pratt and Whitney's Teardown Report, an attachment to this report).

Hartzell Propeller examined the propellers under the supervision of the NTSB, at the facilities of a Atlanta Air Salvage, Griffin, Georgia, on August 22, 2000.

The examination revealed:

Blade butt end impression marks, on the left propeller, indicated that the blades were at a low to mid blade angle, which would have been the normal operating range. A counterweight impact mark on the left spinner dome indicated a low blade angle, which would have been the normal operating range.

The right propeller had score marks on the piston that indicated a very low blade angle. However, the propeller had been driven toward low pitch at impact, as evidenced by the twisting of the blade in the clamp toward low pitch, a link arm witness mark on the guide collar at extreme low pitch, and blade twisting damage.

The propeller examination further revealed that no discrepancies were found on either propeller. All damage was consistent with impact damage. (See the Hartzell Propeller's Teardown Report, an attachment to this report).

MEDICAL AND PATHOLOGICAL INFORMATION

Dr. John Butts performed an autopsy on the pilot, at the Medical Examiners Office, Chapel Hill, North Carolina, on August 1, 2000. According to the autopsy report the cause of death was "multiple blunt force injuries to the head due to plane crash." No findings, which could be

considered causal to the accident, were reported.

Toxicological tests were conducted at the Federal Aviation Administration, Research Laboratory, Oklahoma City, Oklahoma, and revealed, "No ethanol detected in Vitreous...no drugs detected in Blood."

ADDITIONAL INFORMATION

The airplane was released to Mr. Gary Ramsey of Atlanta Air Salvage, on behalf of the owner's insurance adjuster, Mr. Les Sychec, and at the request of the owner, on August 18, 2000.

Pilot Information

Certificate:	Commercial; Private	**Age:**	45, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	09/29/1999
Occupational Pilot:		**Last Flight Review or Equivalent:**	04/21/1999
Flight Time:	1725 hours (Total, all aircraft), 147 hours (Total, this make and model), 1600 hours (Pilot In Command, all aircraft), 207 hours (Last 90 days, all aircraft), 93 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	de Havilland	**Registration:**	N201RH
Model/Series:	DHC-6-200 DHC-6-200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Utility	**Serial Number:**	163
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	07/06/2000, AAIP	**Certified Max Gross Wt.:**	11579 lbs
Time Since Last Inspection:	21.5 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	28711 Hours at time of accident	**Engine Manufacturer:**	P&W Canada
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	PT6A-27
Registered Owner:	WIN WIN AVIATION INC.	**Rated Power:**	620 hp
Operator:	WIN WIN AVIATION INC.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	RDU, 435 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	0033 EDT	**Direction from Accident Site:**	330°
Lowest Cloud Condition:	Clear	**Visibility**	6 Miles
Lowest Ceiling:	Broken / 500 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	23°C / 23°C
Precipitation and Obscuration:			
Departure Point:	HINCKLEY, IL (OC2)	**Type of Flight Plan Filed:**	VFR
Destination:	LOUISBURG, NC (LHZ)	**Type of Clearance:**	VFR
Departure Time:	2000 CDT	**Type of Airspace:**	Class B; Class C

Airport Information

Airport:	Raleigh-Durham Intl. (RDU)	**Runway Surface Type:**	Asphalt
Airport Elevation:	435 ft	**Runway Surface Condition:**	Unknown
Runway Used:	23L	**IFR Approach:**	None
Runway Length/Width:	7500 ft / 150 ft	**VFR Approach/Landing:**	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious, 1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious, 1 Minor	**Latitude, Longitude:**	35.849722, -78.751111

Administrative Information

Investigator In Charge (IIC):	ALAN J YURMAN	**Report Date:**	05/21/2002
Additional Participating Persons:	JAMES CREIDER; FAA; Greensboro, NC Dave Fisher; Bombardier Aerospace; Downsview, Ontario, Thomas Berthe; P&W Canada; Longueuil, Canada,		
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/.		