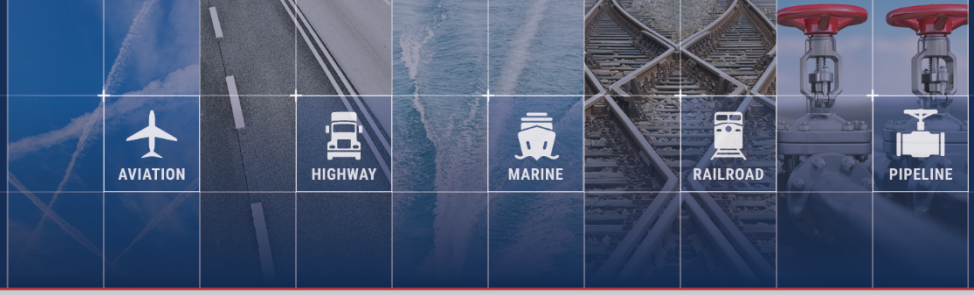

Aviation Investigation Final Report

Location:	PORT ALSWORTH, Alaska	**Accident Number:**	ANC98FA145
Date & Time:	September 9, 1998, 10:45 Local	**Registration:**	N1433Z
Aircraft:	de Havilland DHC-2	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	5 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The float equipped airplane was attempting to cross a mountain pass, following two other company airplanes. The first two pilots, and passengers, described five to seven miles visibility, 700 feet ceilings, clouds hanging on the mountainsides, and misty rain. The route of flight required several turns in the pass. The pilot had not flown through the pass in marginal Visual Flight Rules (VFR) weather before this flight. After the first two airplanes went through the pass, they lost radio contact with the accident pilot, and did not see or hear from him again. The wreckage was later located at the head of an intersecting canyon, two miles before the correct pass. The airplane had been modified with a Short Take Off and Landing (STOL) kit. Canadian certification flight tests had determined that this modification eliminated aerodynamic warning of impending stalls, and therefore required an audible stall warning. Company pilots indicated it was common for the stall warning system to activate at an airspeed 10-15 miles per hour above the actual stall. At the time of the accident, the airplane did not have the ventral fin installed, and a takeoff flaps setting was selected. The audible stall warning circuit breaker was found in the pulled (disabled) position.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate airspeed which resulted in an inadvertent stall. Factors associated with this accident were the pilot's unfamiliarity with the geographic area, the low clouds, his becoming disoriented, and the blind canyon into which he flew. An additional factor was the intentionally disabled stall warning system.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
1. (F) STALL WARNING SYSTEM - DISABLED
2. (C) AIRSPEED - INADEQUATE - PILOT IN COMMAND
3. (F) LACK OF FAMILIARITY WITH GEOGRAPHIC AREA - PILOT IN COMMAND
4. WEATHER CONDITION - LOW CEILING
5. (C) STALL - INADVERTENT - PILOT IN COMMAND
6. (F) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
7. TERRAIN CONDITION - BLIND/BOX CANYON

Factual Information

HISTORY OF FLIGHT

On September 9, 1998, about 1045 Alaska daylight time, a Dehavilland DHC-2, float equipped airplane, N1433Z, sustained substantial damage when it impacted mountainous terrain about 3,600 feet msl near Telequana Pass, Alaska. The pass is about 48 miles north-northwest of Port Alsworth, Alaska. The commercial pilot and the four passengers sustained fatal injuries. The flight was operated by Rust's Flying Service, Inc., of Anchorage, Alaska. The flight was conducted under 14 CFR Part 135 as an on-demand air taxi transporting hunters from the Lake Hood seaplane base in Anchorage, to a hunting lodge on the Hoholitna River, about 190 miles west of Anchorage. Visual meteorological conditions prevailed at the time of the accident, and a company VFR flight plan was in effect.

The accident airplane was the third of three company airplanes crossing the mountain pass, spaced between three and five miles apart. The pilots described the cloud ceilings as 4,500 feet msl at the 3,300 feet msl pass, with five miles visibility.

The pilots of the first two airplanes told the NTSB investigator-in-charge (IIC) that they were in radio contact with the pilot of the accident airplane as they crossed through the pass, and then lost radio contact as they descended below the steep terrain. Both lead pilots indicated they believed it was due to terrain, and that when they continued to the west and still were not able to make contact with the airplane, they assumed the pilot had turned around because he saw something he did not like, and was attempting another route.

The first two pilots arrived at their destination and noted that the accident airplane had not arrived. They waited about one hour, then continued along their scheduled routes. They told the NTSB IIC that they were concerned when the accident pilot did not arrive, and asked the lodge owner to notify the company if the airplane had not arrived within one hour of their departure. The air taxi company owner told the NTSB IIC that they never received a call from the lodge telling them the airplane had not arrived.

At 1235, the Alaskan Air Command Rescue Coordination Center (RCC) began a search after search and rescue satellites received an Emergency Locator Transmitter (ELT) signal on 121.5 MHz. At 1400, the National Park Service dispatched an airplane from Port Alsworth to search for the ELT at the request of RCC. At 1500 the search airplane heard a signal on 121.5 MHz coming from the canyon where the wreckage was discovered. Due to low ceilings and visibility, the airplane pilot requested a helicopter be used to search the canyon. At 1825, the wreckage was located by the crew of an Alaska Air National Guard helicopter.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate for single engine land and sea airplanes, and multiengine land airplanes. He held an instrument rating, and a flight instructor rating for single engine airplanes. His most recent second class medical certificate was issued on May 26, 1998, and contained no restrictions. He was an airframe and powerplant mechanic.

The pilot was first hired by the company as a mechanic, on March 3, 1998. He had been employed as a pilot since May 1, 1998. This was his first season with this company as a pilot, and his third season flying in Alaska. It was his first season flying in the Alaska Mountain Range area. The Director of Operations and Chief Pilot told the NTSB IIC it was his fourth time through Telequana Pass. They said the previous trips were in better weather conditions than the day of the accident.

The pilot was qualified in the Cessna 206 on May 22, 1998, and the DeHavilland DHC-2 on July 17, 1998. The pilot's initial hire flight training and 14 CFR 135.293 competency checks were performed in the Cessna 206. His transition training to the DHC-2 consisted of ground training and a flight examination to meet the requirements for CFR 135.293. Stall maneuvers in the DHC-2 were recorded on the pilot's 135.293 check flight record on July 17, 1998.

According to the pilot's personal logbook, and company flight records, at the time of the accident he had accumulated about 1,820 hours of flight time. The pilot had accrued 151 hours of experience in the DeHavilland DHC-2. In the previous 90, and 30 days, he had flown 338 and 118 hours, respectively. Of these, 133 and 59 hours were in the DHC-2. The day prior to the accident he flew five hours, all in the DHC-2.

The day of the accident was a scheduled work day for the pilot. The accident flight was the pilot's first flight of the day.

AIRCRAFT INFORMATION

General

The airplane was a Dehavilland DHC-2 Mark I "Beaver," manufactured by the DeHavilland Aircraft Company of Canada. It was registered to Rust Properties, LLC, of Anchorage, Alaska. The airplane was operated by Rust's Flying Service, Inc., of Anchorage. The airplane was powered by a single Pratt & Whitney R-985 radial engine, rated to produce 450 shaft horsepower. The airplane had accumulated 12,948 total hours in operation at the time of the accident.

The airplane was configured with seating for the pilot and four passengers.

The airplane's maximum allowable takeoff weight was 5,370 pounds. It had STC number SA4025NM incorporated, which provided a gross weight increase from 5,100 pounds. The horizontal stabilizers were modified with Kenmore "finlets" on the stabilizer tips. The airplane

did not have a lower surface ventral fin installed underneath the empennage.

It was equipped with EDO 4930 nonamphibious floats. The airplane had always been operated on floats while owned by the company. The airplane was modified with an AOG Air Support Baron / STOL (Short Take Off and Landing) kit on May 5, 1994. This modification was approved under U.S. Supplemental Type Certificate (STC) number SA-1070NE, and Canadian Supplemental Type Approval (STA) number SA92-45.

This STOL modification consisted of a full span contoured leading wing edge, drooped wing tips, upper wing surface stall fences, and trailing edge flap gap seals. Additionally, an electrically powered, aural stall warning horn was installed as a mandatory component in the modification kit.

The airplane was maintained on a 100 hour inspection cycle. The most recent inspection was an annual inspection completed on August 19, 1998, 64 hours prior to the accident. A review of maintenance records revealed no repetitive maintenance problems. Other pilots who had recently flown the airplane did not recall any discrepancies.

Weight and Balance

The pilot fueled his own airplane. It is unknown how much fuel he placed in the airplane. The pilots of the other two airplanes in the flight said they departed Lake Hood with full fuel in the forward and center tanks, eight gallons in the aft tank, and full tip tanks. They told the NTSB IIC that they expected the accident pilot to use a similar fuel load.

498 pounds of cargo was removed from the airplane (443 pounds at the accident site, and an additional 55 pounds after airplane recovery). An estimated additional 40 pounds of perishable goods was left at the wreckage site. The total cargo accounted for was 538 pounds (443 + 55 + 40 pounds).

According to their driver's licenses, the passengers and pilot weighed a combined total of 890 pounds.

Using these weights, the estimated weight at the time of the accident was as follows:

Empty weight of airplane - 3,386 pounds Pilot and Passengers - 890 pounds Cargo (baggage) - - 538 pounds Zero Fuel Weight - 4,814 pounds Estimated fuel at takeoff - 556 pounds (93 gallons to reach maximum allowable take off weight) Total weight at takeoff - 5,370 pounds

Estimated fuel consumption (1 hour 15 minutes) - 150 pounds (25 gallons) Total weight at accident - 5,222 pounds

The estimated airplane center of gravity (CG) at the accident site was 104.17 inches aft of datum, with a forward and aft limit of 101.25 and 106.1 inches, respectively.

METEOROLOGICAL INFORMATION

The pilot received a weather brief from the company prior to departure. The Area Forecast for the Kuskokwim Valley called for mountains obscured in clouds above 3,500 feet.

The pilots of the first two airplanes, five minutes in front of the accident flight, described the weather as broken clouds at 700 feet above the ground, light drizzle and mist, with easterly winds of 10 to 15 knots. They estimated the visibility as five to seven miles, and the temperature about 37 degrees Fahrenheit. Both pilots indicated there was light turbulence through the area of Telequana Pass. The pilot of the first airplane told the IIC that he flew through the pass at 3,900 feet msl. He described mist hanging on the mountains, light rain, and an overcast layer estimated at 4,500 feet msl.

The pilot of the National Park Service airplane who located the accident site told the NTSB IIC that at 1500 on September 9, 1998, the ceilings were about 500 feet above the elevation of Telequana Pass. Winds at that time were blowing from the east toward the pass, and were blowing out of the canyon where the wreckage was located.

The NTSB IIC and the FAA coordinator interviewed the front seat passengers in both lead airplanes. Both of these passengers said they wore headsets and listened to the pilots talking to each other. Both passengers said that the first two pilots were talking to the accident pilot on the radio, and giving him directions about how to get through the pass, and where to turn.

The front seat passenger in the second airplane said he looked at the altimeter several times as they went through Telequana Pass, and that they went through between 3,600 feet msl and 3,800 feet msl. He indicated the weather was "not too bad." He described patchy clouds above them, and below them, and that clouds were hanging on the sides of the valleys. He stated that the first airplane went through the pass at a lower altitude than the second. Both passengers described the weather as misty.

COMMUNICATIONS

The pilot was in radio contact with the two company airplanes who were traveling through the pass in front of him. The first two pilots estimated that the third airplane was about five miles in trail behind the second. They told the NTSB IIC that as they approached the pass from the east, the accident pilot told them he had their aircraft in sight. They both estimated that as they made the final turns through Telequana Pass, the accident airplane would not have been able to see them.

When questioned whether they were concerned when no contact was made, the other pilots responded that if the pilot had turned around to use a different route, it would be several hours before he reached the Hoholitna River lodge. Since radio contact is very difficult in the mountain passes, they assumed he was out of radio coverage. About 1330, the pilot of the

second airplane stopped in Port Alsworth and contacted the company to determine if they had heard from the accident pilot.

WRECKAGE AND IMPACT INFORMATION

The NTSB on-site investigation began at 1300 on September 10, 1998. The NTSB IIC, an FAA inspector from the Anchorage Flight Standards District Office (FSDO), an Alaska State Trooper, and three National Park Service rangers were present.

The airplane came to rest in the bottom of an approximately 1/2 mile wide box canyon, about two miles northeast of Telequana Pass. The airplane was at 3,600 feet msl, at the head of a canyon oriented 135/315 degrees magnetic. The nose of the airplane was pointed 090 degrees magnetic, and the wings remained perpendicular to the fuselage. The tail was offset to the left of the fuselage, pointed about 300 degrees magnetic.

Relative to the horizon, the airplane was situated almost 90 degrees nose down. The debris pattern was confined to an area less than 30 feet in diameter.

The wings remained attached to the fuselage, and were deformed directly aft. The engine was pushed aft about three feet, into the cockpit area. The entire empennage was deformed to the left at mid-cabin. The upper wing surfaces did not show impact damage. The leading edges of both wings were crushed aft along their entire span to the forward spar.

Both EDO 4930 floats were crushed directly aft to the forward spreader bar. The tails of both floats were folded forward over the tops of the floats. The left float displayed more damage than the right float. The top of the vertical stabilizer was bent over to the right. The right float tail section had red paint transfer on it.

No flight control system anomalies were noted.

The trailing edge flap hydraulic actuator was extended 4.5 inches, which corresponds to 40.5 degrees, or slightly beyond the "takeoff" setting. The right flap torque tube was seperated from the flap drive arm. The fracture ends appeared shiny and jagged.

The propeller blades exhibited torsional twisting, bending toward the forward face, and chordwise gouges. Two of the blade tips were curled 360 degrees. All blades were broken free in the propeller hub and free of their respective pitch guides. The propeller spinner showed rotational tearing. No evidence was found of preimpact engine anomalies.

All three fuel tanks were ruptured, and the sandy soil under the airplane smelled like gasoline. The fuel selector valve was in the forward tank position.

Personal camping gear was loaded in the airplane aft of the passengers, and in the watertight compartments of the EDO 4930 floats.

No discrepancies were found with the pitot-static system, or the flight attitude indicating system. The turn indicator was deflected full left.

The STALL WARN circuit breaker was in the OUT (disabled) position. It was able to be reset, and the detents were solid.

A wristwatch found in the airplane was stopped at 10:45.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination was performed on the pilot by the State of Alaska Medical Examiner, 5700 East Tudor Road, Anchorage, Alaska on September 11, 1998. The examination report cited "massive deceleration type injuries" as the cause of death.

Toxicological samples taken from the pilot were analyzed by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. According to the toxicology report (attached), all tests were negative.

SURVIVAL ASPECTS

Restraint Aspects

All occupants were still restrained in their respective seats. The integral lap belt restraints remained intact. The two cockpit seats remained attached to the floor structure. The cargo did not remain restrained by a nylon barrier assembly, which was aft of the passengers. This nylon barrier tore free of its attachments.

Flight Following

The company Operations Manual, L-1/R-0/07-01-96, FLIGHT LOCATING PROCEDURES, stated in part: "If, on a company flight plan, an aircraft is overdue by one hour, notification will be made by RUST'S FLYING SERVICE, INC. to the FSS."

The airplane was logged off of Lake Hood by the company flight followers at 0930, with an estimated time of return (ETA) to Lake Hood of 1430. Copies of the company flight log provided to the NTSB IIC depicted an ETA of 1430. The other pilots in the flight, and the Director of Operations, told the NTSB IIC that this ETA was verbally revised by the pilot via radio to 1630. At 1739 the company notified the RCC that the airplane was overdue. RCC records indicate that the RCC controller was told that the accident airplane should have returned to Lake Hood by 1430, and the company had not been able to contact the pilot. No report of an overdue airplane was recorded by the FAA Kenai, Alaska, Flight Service Station.

TESTS AND RESEARCH

The company operated all of their DHC-2 airplanes with Baron STOL modified wings. The company did not operate any unmodified DHC-2s at the time of the accident.

The Director of Operations and Chief Pilot were asked by the NTSB IIC what training was provided to pilots regarding the characteristics of the Baron STOL kit. They responded that initial and annual recurrent training included of a ground discussion of slower stall speeds, and the ability to get off the water faster than an unmodified DHC-2. Also discussed were the docile stall characteristics which result in the need for an aural stall warning. Flight training involved demonstration and performance of stalls.

The company DHC-2 pilot written test includes the statement that no performance data is provided with the modified airplanes. The only written statement regarding the Baron STOL kit modification found by the NTSB IIC in the company training manual was that stall and takeoff performance is improved.

No training videos or performance data are available or produced by the STOL kit manufacturer. The manufacturer states that the unmodified DHC-2 takeoff, landing, and stall performance values are to be used for planning, and that the STOL modification will improve these an unspecified amount.

Stall Performance (Non-modified DHC-2 wing)

The flight handbook for the U.S. Air Force U-6A (military DHC-2), Flight Characteristics section, includes the following statements: "Power-On Stall. At cruise power and with various flap settings, the stall characteristics do not differ to any great extent, and there is little or no stall warning under these conditions. At the stall, the left wing will drop and the ensuing roll will continue until recovery action is taken; the roll being more pronounced with an aft CG condition."

The limitations section of the DHC-2 Mark I flight operating handbook, section 4.6.1 Load Factors, states: "In tight turns, flight load factors may reach the load limits, and may also increase the danger of an unintentional stall. The variation of flaps-up stalling speed and load factors with angle of bank are given below: 0 degrees 60 mph IAS 50 degrees 85 mph IAS 60 degrees105 mph IAS"

The company training manual, J-3.21/R-0/11-01-96, states, in part:

"Stalls cont. Maintenance of coordinated flight... Recognition of the imminent stall and promptness of recovery. Avoidance of full stalls, excessive pitch changes, and excessive altitude loss."

There is no written mention in the company training manual of stall warning system requirements, or prestall buffet characteristics for the STOL modified DHC-2 wing.

AOG Air Support STOL Kit

Certification approval of the "Baron STOL" kit was conducted initially in Canada. Follow-on certification was received from the FAA on the basis of a bilateral agreement between Canada and the U.S. In order to assist in achieving both Canadian and U.S. certifications, Transport Canada reviewed the modification for compliance with the three applicable airworthiness standards for the DHC-2. These were the British Civil Airworthiness Requirements (BCAR) for Canada, the U.S. Civil Air Regulations Part-03 (CAR-03), and the U.S. Civil Aeronautics Manual 3 (CAM-3).

Civil Aeronautics Regulations (CAR) 03 of May 15, 1956, paragraph 3.120(f) states: "A clear and distinctive stall warning shall precede the stalling of the airplane...The stall warning shall begin at a speed exceeding that of stalling by not less than 5 but not more than 10 miles per hour and shall continue until the stall occurs."

Civil Aeronautics Manual (CAM) 3, dated May 1962, paragraph 3.120-2, Indications of Stall Warnings, states: "(a)(1)Satisfactory items include: "Buffeting... Stall warning instrument, either visual or aural."

British Civil Airworthiness Requirements (BCAR) section D.5.3.3 (Stalling), states, in part: "The aeroplane should ngive, by juddering or other means, clear warning of the approach to the stall from straight or turning flight. This characteristic will be taken into account in deciding whether the behaviour at the stall is acceptable."

The Transport Canada Flight Test Inspection / Evaluation for STA # SA92-45, dated May 23, 1990, for a DHC-2 configured with EDO 4930 floats, Kenmore finlets, and the complete "Baron STOL" kit, stated in part: "Stall Warning... did not comply with BCAR section D with the Flap Gap Seal installed. Approval of the gap seal would require changes to enhance stall warning or installation of a stall warning system." "Stability... The static directional stability tended to be marginal and under some circumstances the rudder would not tend to re-center...The tendency to "overbalance" was most pronounced with the gap seal installed; The worst case was in the climb condition with flap up, or in the climb position... When both the ventral fin and finlets were installed the overbalance condition was rectified, and in the climb configuration the pedals would tend to re-center, albeit slowly." "...with or without the gap seal and Kenmore finlets only installed, the aircraft did NOT comply with CAR 03; With the Kenmore finlets and DHC ventral fin installed, the aircraft satisfied the CAR 03 requirements." "Conclusions and Recommendations. Approval...is recommended...provided that...For Canada (STA) - if the flap gap seal is installed the aircraft must be fitted with both ventral fin and finlets and in addition a stall warning system must be installed and approved. For the USA (STC) - the aircraft must be fitted with both Kenmore finlets and DHC ventral fin, or equivalent."

The manufacturer then added a stall warning system to the modification package, and further certification tests were conducted.

The Transport Canada Flight Test Inspection / Evaluation for STA # SA92-45, dated August 14, 1991, after testing of a stall warning system installation stated: "The volume of the warning horn was inadequate... The warning could not be considered clear and distinctive. The warning tended to fire at a relatively high speed (stall plus 10-15 mph IAS). It would be much better if the system 'fired' somewhere between 5 and 10 mph in advance of the stall."

These corrections were made, and Canadian approval of STA # SA92-45 was received be the manufacturer on July 23, 1992.

A review of the correspondence from Transport Canada, to the FAA New York Aircraft Certification Office on December 18, 1992, applying for U.S. Supplemental Type Certification (STC) # SA1070NE, revealed that all drawings and installation instructions included a stall warning system, with no mention that it was optional. U.S. approval for STC # SA1070NE was received on March 23, 1993.

STC # SA1070NE contains the exact language as Canadian STA number SA92-45, and requires that the stall warning system be installed. The kit installation Drawing # AOG-01-001-1, dated May 25, 1992, include the following components: Full span contoured leading edge, drooped wing tips, wing fences, flap gap seals, and an audible stall warning system.

The Flight Manual Supplement #1, revision B, dated Feb 25, 1993, Section IV - Operating Limits specifies: "Approved Configurations 1/ The Baron Stol kit is comprised of: (a) - Full span contoured leading edge, drooped wing tips, wing fences, Flap gap seals, and an audible stall warning system, ...installed in accordance with AOG Air Support inc., installation Drawing # AOG-01-001-1, Dated May 25/92 or later DOT approved revision. (b)- If... floats equal or exceed EDO model 4930 size, ...an approved ventral fin and approved horizontal stabilizer auxiliary finlets."

The STC which was installed on the accident airplane included Flight Manual Supplement No. 1, Revision B dated February 25, 1993, and Flight Manual Supplement 2, Initial Issue, dated February 25, 1993. These supplements state, in part:

"APPROVED CONFIGURATIONS 1/ The Baron STOL kit is comprised of: (a) - Full span contoured leading edge, * Drooped wing tips * Wing fences * Flap Gap Seals * Audible Stall Warning System...

(b) - If this kit is incorporated on an amphibious or float plane whose floats equal or exceed EDO model 4930 size, this kit must be accompanied by the installation of an approved ventral fin and Horizontal stabilizer auxiliary finlets. ..."

Revision D dated March 16, 1998 to STA 92-45 (and STC SA-1070NE), and Flight Manual Supplement 1, removed the requirement for both the ventral fin and the auxiliary finlets. Revision D provided authorization to operate with either one or the other, and states, in part:

"APPROVED CONFIGURATIONS 2/ (b) - If this kit is incorporated on an amphibious or float plane whose floats equal EDO model 4930 size, this kit must be accompanied by the installation of either an approved ventral fin or approved Horizontal stabilizer auxiliary finlets."

The NTSB IIC did not find evidence of additional flight testing by Transport Canada, or the FAA, prior to this approval.

AOG Drawing # AOG-01-002-4, reference "D" Leading Edge Skins Installation, includes installation of wiring for the stall warning.

AOG Drawing # AOG-01-002-6, reference "F," Stall Warning System Installation is required by AOG Drawing # AOG-01-001-1. Additionally, the stall warning vane and structural opening in the contoured leading edge is a standard in all kits produced by the manufacturer. There is no mention in these instructions that the stall warning is optional.

Company personnel interviewed said that the stall warning horn would activate in flight at speeds 10 to 15 miles per hour above stall. The STOL kit manufacturer told the NTSB IIC that the stall warning vane activation speed was adjustable. Company personnel, and the NTSB IIC, confirmed that the vane position on the wing is adjustable to set the activation speed.

Correspondence dated December 8, 1997, from the Transport Canada certification flight test pilot who performed the flight tests, to the NTSB investigator, noted the following:

Testing was performed using a Baron STOL modified DHC-2 mounted on EDO 4930 floats, at weights from 5100 to 5400 pounds. The power used for power on stalls was that required for level flight at 1.4Vs and maximum continuous power (MCP) of 30 inches manifold pressure. There was no record of stall testing being performed at takeoff power (TOP) of 36.5 inches manifold pressure and 2300 rpm. The test pilot wrote, "Stall testing conducted did not highlight significant adverse stall characteristics. I would assess the stall characteristics of the Beaver as docile, although... if the a/c is stalled with the ball displaced from the center, there is a tendency to roll off (slowly) as compared to dropping the nose slightly... ."

The test pilot further stated in correspondence which referenced a similarly configured DHC-2, "In the configuration you describe [EDO 4930 floats, Kenmore finlets, no ventral fin, and a deactivated stall warning circuit breaker] I would expect that there was little, if any, clear and distinct stall warning."

ADDITIONAL INFORMATION

All wreckage was released to representatives of the operator on September 10, 1998.

Pilot Information

Certificate:	Commercial; Flight instructor; Private	**Age:**	33,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	May 26, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1720 hours (Total, all aircraft), 150 hours (Total, this make and model), 1670 hours (Pilot In Command, all aircraft), 338 hours (Last 90 days, all aircraft), 118 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	de Havilland	**Registration:**	N1433Z
Model/Series:	DHC-2 DHC-2	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	595
Landing Gear Type:	Float	**Seats:**	5
Date/Type of Last Inspection:	August 19, 1998 100 hour	**Certified Max Gross Wt.:**	5370 lbs
Time Since Last Inspection:	65 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	12948 Hrs	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	R-985-AN14B
Registered Owner:	RUST PROPERTIES, LLC	**Rated Power:**	450 Horsepower
Operator:	RUST'S FLYING SERVICE, INC.	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	ERHA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	5 miles
Lowest Ceiling:	Overcast / 4500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:	Light - Showers - Rain		
Departure Point:	ANCHORAGE , AK (LHD)	**Type of Flight Plan Filed:**	Company VFR
Destination:	HOHOLITNA RIVER, AK	**Type of Clearance:**	None
Departure Time:	09:30 Local	**Type of Airspace:**	Class G

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 Fatal	**Latitude, Longitude:**	60.200927,-154.280364(est)

Administrative Information

Investigator In Charge (IIC):	Thomas, Matthew
Additional Participating Persons:	DARREL K WOODWORTH(FAA FSDO); ANCHORAGE , AK WILLIAM KUNKLER; ANCHORAGE , AK
Original Publish Date:	March 31, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=43978