# Aviation Investigation Final Report

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| **Location:** | NEWCASTLE, Oklahoma | **Accident Number:** | FTW99FA044 |
| **Date & Time:** | December 6, 1998, 09:34 Local | **Registration:** | N1826S |
| **Aircraft:** | Beech 58 | **Aircraft Damage:** | Destroyed |
| **Defining Event:** | | **Injuries:** | 1 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The 4,550-hour pilot received two weather briefings and filed an IFR flight plan for the 152-nautical mile flight. The briefers informed the pilot of Convective SIGMETs, AIRMETS, and a Severe Thunderstorm Watch in effect along the route of flight. Approximately 19 minutes before the accident, a Boeing 737 executed a missed approach after encountering severe turbulence and wind shear during an approach to an airport 12 miles northwest of the accident airplane's destination. The pilot was informed of this encounter by air traffic control. As the flight neared its destination, the pilot was cleared for a localizer approach to runway 03. The airplane was observed on radar about one mile north of the final approach course. The pilot reported that he was not going to be able to continue the approach. When questioned by the tower about his intentions, the pilot replied, 'I am going to stay right here until I get out of some of this.' The wreckage of the twin-engine airplane was located a mile north of the final approach course, about 6 miles southwest of the landing threshold for the runway. Physical evidence and ground signatures at the initial point of impact indicated that the airplane, configured with the landing gear and flaps in the retracted position, impacted the ground on a measured magnetic heading of 342 degrees at a high speed in a nose low attitude in a slight left turn. Examination of weather data revealed that the last radar return from the airplane occurred in the vicinity of a frontal boundary, where strong wind shear and severe turbulence were present.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's loss of control due to his inadvertent encounter with severe turbulence and wind shear during an instrument approach. Factors contributing to the accident were the severe turbulence and the wind shear.

## Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings
1. (F) WEATHER CONDITION - TURBULENCE IN CLOUDS
2. (F) WEATHER CONDITION - WINDSHEAR
3. (C) FLIGHT INTO ADVERSE WEATHER - INADVERTENT - PILOT IN COMMAND
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Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings
4. AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. TERRAIN CONDITION - OPEN FIELD

## Factual Information

HISTORY OF FLIGHT

On December 6, 1998, at 0934 central standard time, a Beech 58, twin-engine airplane, N1826S, was destroyed upon impact with terrain following an in-flight encounter with severe weather while on a localizer instrument approach near Newcastle, Oklahoma. The instrument rated private pilot, sole occupant of the airplane, was fatally injured. The airplane was owned and operated by the pilot. The airplane was operating in instrument meteorological conditions and an IFR flight plan was filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight originated from the Idabel Airport (F62), near Idabel, Oklahoma, at approximately 0852, with the Max Westheimer Airport (OUN), in Norman, Oklahoma, as its intended destination. (OUN is located 152-nautical miles northwest of F62.)

At 0915, a Boeing 737, Southwest Airlines (SWA) flight 474 from Dallas Love Field Airport (DAL) to Oklahoma City Will Rogers World Airport (OKC), executed a missed approach after encountering severe turbulence and wind shear during an instrument approach to runway 35R at OKC. (OKC is located 12-nautical miles northwest of OUN.) The flight diverted back to DAL due to the weather in the OKC area. The captain stated that the event was prominent at 3,000 feet after the glide slope was captured. The captain further reported that the airspeed fluctuated plus or minus 50 knots. The pilot of N1826S was advised by air traffic control of the severe turbulence/wind shear encounter reported by the Southwest flight. N1826S was in level flight at 4,000 feet, operating in smooth air at that time.

According to OUN control tower personnel, the pilot established radio contact with them at 0932 while the airplane was inbound for the localizer approach to runway 03 at OUN. About a minute later, the airplane was observed on radar about one mile north of the final approach course. The pilot reported that he was not going to be able to continue the approach. When questioned by the tower about his intentions, the pilot replied, "I am going to stay right here until I get out of some of this." The pilot did not reply to any further radio calls from the tower.

A witness near the accident site observed the airplane descending out of the clouds heading in a westerly direction with a 45-degree nose down attitude. The witness lost sight of the airplane, heard the sound of the ground impact, and soon thereafter heard the sirens from the fire and rescue vehicles.

PERSONNEL INFORMATION

The 56-year old pilot received his private pilot certificate with a single engine land airplane rating on March 15, 1972. He then added a multi-engine land airplane rating on November 18, 1977, and an instrument airplane rating on June 5, 1979.

The pilot purchased the 1981-model airplane new from the factory and was reported to have completed a factory checkout prior to accepting the airplane for the flight home. The pilot was reported to have accumulated a total of 4,550 flight hours, of which 2,410 hours were in multi-engine airplanes, with a total of 2,337.5 hours in the accident airplane. Further review of the pilot's logbook revealed that the pilot had accumulated a total of 270 hours in actual instrument meteorological conditions (IMC), of which 5 hours were in the 90 days preceding the accident.

AIRCRAFT INFORMATION

The airplane was home-based and hangared at the Idabel Airport. Total time on the airframe was established at 2,337.5 flight hours. The most recent annual inspection was completed at Norman, Oklahoma, on July 2, 1998 at 2,258.6 hours. The factory remanufactured (Golden Medallion) IO-520-CB9F Continental engines were overhauled on November 26, 1996, and had accumulated a total of 301.9 hours since installation.

The airplane was equipped with a color weather radar and propeller anti-icing system. The airplane was not equipped with a wing and tail de-icing system. The airplane was configured in the "club seating" configuration with a total of 6 seats.

METEOROLOGICAL INFORMATION

A review of the McAlester Automated Flight Service Station (AFSS) weather briefings provided to the pilot at 0727 and 0828 indicated that the AFSS specialists informed the pilot of Convective SIGMETs, AIRMETs, and a Severe Thunderstorm Watch in effect along the route of flight.

According to the Meteorological Factual Report prepared by the NTSB meteorologist in support of the accident investigation, the surface weather observations from 0800 to 1000 local showed that a northeast-southwest oriented cold front was moving through central Oklahoma in a southeast direction at about 15 knots at the time of the accident. Distinctly different air masses were located on either side of the cold front. The air mass southeast of the front was warm, moist, and unstable, with gusty southerly surface winds prevailing through the area. Northwest of the front, temperatures dropped by 10 to 15 degrees Centigrade, and the gusty surface winds veered to the northwest. Scattered moderate to very strong thunderstorms were located along the frontal boundary, with the thunderstorm cells generally moving toward the northeast.

An overlay of the ground tracks for SWA flight 474 and N1826S on weather radar plots revealed that both the SWA 474 encounter with severe turbulence/wind shear and N1826S's last radar return occurred in the vicinity of the cold frontal boundary, where strong wind shear and severe turbulence were present in the layer between the two air masses.

Other than SWA Flight 474, there were seven additional pilot reports (PIREPs) involving turbulence between 0837 and 1040 on the morning of the accident.

## AIDS TO NAVIGATION

The approach being flown by the airplane at the time of the accident was flight-checked by the FAA following the mishap. The flight check did not reveal any anomalies with the approach.

## COMMUNICATIONS

The transcripts for all the radio communication between the pilot of the airplane and the air traffic control facilities during the flight were reviewed. No reported distress calls were received from the pilot prior to the accident.

## AERODROME INFORMATION

The flight's destination was the Max Westheimer Airport (OUN) in Norman, Oklahoma. The airport is owned and operated by the University of Oklahoma, and is located 3 miles northwest of Norman. The air traffic at the airport is controlled by a contract control tower operated by Midwest ATC Services, Inc. The control tower is open on a year-round basis from 0700 to 2200 daily. Oklahoma City Approach and Departure Control, located at OKC, provides approach and departure control services for OUN.

Runway 03 is 4,747 feet long by 100 feet wide, the touchdown zone elevation is 1,176 feet MSL, and the runway is served by a localizer instrument approach. There are three additional published instrument approaches for the airport.

An Automatic Weather Observation System (AWOS-3) on frequency 119.55 provides weather information.

## WRECKAGE AND IMPACT INFORMATION

The wreckage of the airplane was located by local residents approximately one mile north of the final approach course, about 6 miles southwest of the landing threshold for runway 03. The coordinates for the point of initial impact were: north 35 degrees 11.46 minutes and west 97 degrees 33.02 minutes.

The initial point of impact was in a soft cultivated field. Ground scars corresponding to the outline of the leading edges of both wings, the nose of the airplane, and both engines, were found at the initial point of impact. The impact force had a "splashing effect" on the soft mud. The ground scars corresponding to the engines were two craters, approximately 16-to-20 inches in depth. The propeller spinner assembly for the left engine and portions of the bottom engine cowling were found in the crater made by the left engine. The right propeller assembly was found buried in the crater made by the right engine. The outer portions of both elevators,

which house the elevator counterweights, separated from the elevators. Both were found buried in the ground at approximately a 30-degree angle. The distance between the two counterweights was measured at 15 feet. The avionics antennas installed on the belly of the airplane were also found at the initial point of impact.

After the initial impact, the airplane bounced, became airborne, and struck a barbed wire fence located at the edge of the cultivated field, approximately 92 feet from the initial point of impact. After impacting the fence, the airplane continued through some small evergreen trees and bushes. The fragmented remains of the airplane, which were held together by control cables and electrical wires, came to rest approximately 280 feet from the initial point of impact. The measured magnetic heading from the initial point of impact to the airplane wreckage was 342 degrees. The tail assembly came to rest in the inverted position oriented towards the southwest. The right wing came to rest in the upright position and was also oriented to the southwest. The cabin roof separated from the fuselage and came to rest in the inverted position oriented in a northerly heading. The instrument panels and engine control quadrant came to rest inverted in a northwesterly direction. The left engine (S/N 298820-R) came to rest in the upright position under the empennage of the airplane on the right side of the wreckage. The top portion of the cowling was still partially attached to the engine assembly. The right engine (S/N 298821-R) came to rest under portions of the cabin floorboards.

The heater assembly separated from the airframe. The combustion chamber sustained extensive impact damage; however, it was not compromised.

All flight controls surfaces were accounted for at the accident site. Flight control continuity was established to all flight controls. The jackscrew for the flap assembly was found in the retracted position. The rudder trim tab was found in the neutral position. The right elevator trim tab was found in the 15 degree tab down position, while the left trim tab was found in the 18 degree tab down (nose up) position. The position of the aileron trim tab, located on the left aileron, could not be determined.

All three landing gear assemblies separated from the fuselage and were found within 20-feet of the resting place of the main wreckage. The landing gear was determined to be in the retracted (up) position at the time of impact. The landing gear selector, located on the right side of the engine control quadrant, was found to be in the retracted (up) position.

Fuel, consistent in color and odor with 100LL aviation fuel, was found trapped toward the outer portion of the right wing fuel cell. Two members of the Newcastle Fire Department, who responded to the accident site, reported that there was a very strong smell of fuel upon their arrival at the scene; however, the smell of fuel "subsided rapidly perhaps as result of the weather conditions or the dampness." The fuel selector valve for the right engine was found in the "on" position. The position of the fuel selector for the left engine could not be determined.

Both engines separated from the airframe; however, the control cables remained attached, and

engine control continuity was established from both engines to the throttle quadrant. The throttle levers were found bent in opposite directions, with the right engine power lever ahead of the one for the left engine. The propeller and mixture control levers were found in or near the full-forward position.

The airplane featured a single, throw-over type control yoke assembly. The throw-over arm was found separated from the control column and the control wheel was separated from the arm.

The handle for the main cabin door was found in the locked position, near the main wreckage. The 2 passenger doors were found near the main wreckage. The nose baggage compartment door was found near the initial point of impact.

The pilot's seat separated from the seat rails and was found approximately 150 feet beyond the resting place of the main wreckage. The bottom side of the seat frame showed evidence of extensive vertical crushing, and the backrest remained attached in the upright position. All six seats were accounted for. The two aft facing seats were the only seats that remained attached to the floorboard.

## MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy and toxicological tests were requested and performed on the pilot. The Oklahoma State Crime Lab in Oklahoma City, Oklahoma, performed the autopsy on December 7, 1998. Toxicological tests were negative.

## TEST AND RESEARCH

The engines were shipped to the manufacturer's facility in Mobile, Alabama, for teardown examination. A teardown examination of both engines was completed on January 20-21, 1999, under the supervision of the NTSB investigator-in-charge. The examination did not reveal any anomalies with either engine that would have prevented normal operation.

## ADDITIONAL DATA

The wreckage of the airplane was released to the owner's representative following the completion of the investigation.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 56,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 3, 1997 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 4550 hours (Total, all aircraft), 2337 hours (Total, this make and model), 40 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Beech | **Registration:** | N1826S |
| **Model/Series:** | 58 58 | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | TH-1280 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 6 |
| **Date/Type of Last Inspection:** | July 2, 1998 Annual | **Certified Max Gross Wt.:** | 5424 lbs |
| **Time Since Last Inspection:** | 79 Hrs | **Engines:** | 2 Reciprocating |
| **Airframe Total Time:** | 2337 Hrs | **Engine Manufacturer:** | Continental |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-520-CB |
| **Registered Owner:** | JOHN A. SHIPP | **Rated Power:** | 285 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | None |
| **Operator Does Business As:** | | **Operator Designator Code:** | |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Instrument (IMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | OUN ,1182 ft msl | **Distance from Accident Site:** | 6 Nautical Miles |
| **Observation Time:** | 09:25 Local | **Direction from Accident Site:** | 45° |
| **Lowest Cloud Condition:** | Scattered / 500 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | Broken / 1200 ft AGL | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 13 knots / 21 knots | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 320° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 29 inches Hg | **Temperature/Dew Point:** | 18°C / 16°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | IDABEL , OK (F62 ) | **Type of Flight Plan Filed:** | IFR |
| **Destination:** | NORMAN , OK (OUN ) | **Type of Clearance:** | IFR |
| **Departure Time:** | 08:52 Local | **Type of Airspace:** | Class E |

## Airport Information

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| **Airport:** | NORMAN/UNIV. OF OKLAHOMA OUN | **Runway Surface Type:** | |
| **Airport Elevation:** | 1182 ft msl | **Runway Surface Condition:** | |
| **Runway Used:** | 3 | **IFR Approach:** | Circling;Localizer only |
| **Runway Length/Width:** | 4747 ft / 100 ft | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Destroyed |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 Fatal | **Latitude, Longitude:** | 35.239303,-97.589981(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Casanova, Hector |
| **Additional Participating Persons:** | CARY F WILCOX; OKLAHOMA CITY , OK<br>EDWARD WEBBER; WICHITA , KS<br>STUART E BOTHWELL; WICHITA , KS<br>JOHN T KENT; MOBILE , AL |
| **Original Publish Date:** | July 10, 2001 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=45415 |