Aviation Investigation Final Report

Location:	BRANDYWINE, Maryland	**Accident Number:**	IAD97FA001
Date & Time:	October 2, 1996, 11:12 Local	**Registration:**	N2881W
Aircraft:	Piper PA-32-300	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was receiving vectors from air traffic control for a visual approach to Hyde Field Airport. The pilot was in instrument meteorological conditions and attempting to acquire visual meteorological conditions to conduct the landing. The last assigned altitude given to the pilot by ATC was 1600 feet, which was the minimum vectoring altitude for that area. The pilot radioed ATC and informed them that he was descending to 1000 feet. ATC did not respond to the pilot's radio call. The airplane descended to 1000 feet, circled 360 degrees and had almost completed a second circle when it was lost off radar. The last recorded altitude was 800 feet, the airplane subsequently descended into the terrain with no warning provided by ATC.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilots failure to maintain his assigned altitude in IFR conditions. A related factor was the failure of the radar controller to prevent the descent of N2881W to an altitude below the minimum vectoring altitude. Additionally, the controller's failure to issue a safety alert after the MSAW issued 4 warnings in the radar room.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - CIRCLING (IFR)

Findings
1. (F) WEATHER CONDITION - LOW CEILING
2. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
3. (F) APPROACH/DEPARTURE CONTROL SERVICE - INATTENTIVE - ATC PERSONNEL(DEP/APCH)

Factual Information

HISTORY OF FLIGHT

On October 2, 1996, at about 1112 EDT, N2881W, a Piper PA-32-300, was destroyed when it impacted trees in a heavily wooded area near Brandywine, Maryland, approximately 3 miles south of the Washington Executive/Hyde airport, his intended destination in Clinton, Maryland. The pilot and two passengers received fatal injuries. The flight had originated in Somerville, New Jersey about 0900. Instrument meteorological conditions existed and an instrument flight rules flight plan had been filed. The flight was conducted under the provisions of 14 CFR Part 91. The pilot was receiving air traffic control (ATC) services from the radar controller at the Washington National terminal radar approach control (TRACON).

At 0638, the pilot contacted Millville Flight Service Station (FSS) via telephone for a weather briefing and to file his flight plan. The briefer informed the pilot that IFR conditions existed for his entire route of flight and that the weather at Andrews Air Force Base was: "few clouds at two thousand feet, broken ceilings at two thousand five hundred, overcast at four thousand five hundred and visibility seven in light drizzle and their surface wind zero five zero at four." The pilot filed his flight plan using Baltimore Martin as his alternate.

At the time of the accident the pilot was receiving vectors from ATC in an attempt to find Visual meteorological conditions (VFR) so the pilot could land at Hyde Airport. The last assigned altitude given to the pilot by ATC was 1600 feet, which is the minimum vectoring altitude for that area. The pilot radioed ATC and informed them that he was descending to 1000 feet. ATC did not respond to the pilots' radio call. The airplane descended to 1000 feet, and according to radar data the airplane circled 360 degrees and had almost completed a second circle when contact was lost. The last Radar hit showed the airplane at 800 feet.

PERSONNEL INFORMATION

The pilot held a Commercial certificate for airplane single engine land, Multi-engine land, and instrument airplane. The pilot had about 1,732 civilian flight hours in all aircraft and 450 hours in type. The pilots' most recent third class medical certificate was issued on September 14, 1996.

AIRCRAFT INFORMATION

The Piper PA-32-300, S/N 32-7940180, was manufactured and certificated in 1979. FAA records indicate that the aircraft was registered to the current owner on February 24, 1984. The aircraft's maintenance records indicated that the most recent inspection was an Annual Inspection, which was dated April 1, 1996. The aircraft had accumulated a total time of about

1,290 hours at the time of the accident. A review of the aircraft maintenance logbooks revealed no recorded discrepancies.

METEOROLOGICAL INFORMATION

Instrument Meteorological conditions existed at the time of the accident. A review of automatic terminal information system (ATIS) broadcast from Washington National indicated the following:

Broadcast from 1059 to 1121 EDT

"Washington National Airport information golf one four five eight zulu wind calm visibility one and one fourth light drizzle mist ceiling seven hundred overcast temperature one eight dewpoint one seven altimeter three zero two seven I-L-S runway three six approach in use landing runways three three six and three three the last six hundred feet of runway three three is not visible from the tower Fahrenheit temperature's six four pilots are reminded of the two prohibited areas north of the airport advise on initial contact you have golf".

WRECKAGE EXAMINATION/DOCUMENTATION

On October 3, 1996, an on scene examination was conducted with representatives from the Federal Aviation Administration, the New Piper Aircraft company, and Textron Lycoming. Examination of the wreckage path revealed broken and cut tree limbs between one to two inches in diameter along the first 100 feet of the wreckage path. The wreckage continued another 10 feet and impacted a large hickory tree. Fragments of propeller spinner screws, prop hub and engine sump were found imbedded in the tree trunk. The aircraft then continued another 175 feet and major sections of the airframe structure and engine became displaced by subsequent tree contacts. The total length of the wreckage path was about 285 feet. Aviation fuel was found throughout portions of the airframe and engine components/systems. An examination of the engine assembly disclosed the following: The No. 1 cylinder and one propeller blade were found separated. The front section of the engine case was destroyed exposing the crankshaft and camshaft. Repeated searches in the area through thick undergrowth recovered all engine components except the right magneto. Of the two mounting lugs for the right magneto, one was sheared off, the other was found tight and secure. Multiple crankcase fractures limited crankshaft rotation. Partial disassembly of the engine included inspection and testing of individual components of the air induction, fuel injection, ignition, lubrication and exhaust systems, with no pre-impact anomalies noted. Inspection of the spark plugs revealed clean burning combustion deposits consistent with normal operation.

Examination of the propeller and spinner assemblies disclosed that one blade was torn from the hub and was bent moderately aft. Both blades had leading edge damage and chordwise scratches. The opposite blade remained in the hub, torsional bending was noted, and was bent forward at the tip. The internal pitch change mechanism of both blades was found broken.

AIR TRAFFIC CONTROL INFORMATION

The following is a brief summary of some of the radio transmissions that occurred between the pilot and Air Traffic Control near the time of the accident. For a complete transcript see the attached Air Traffic Control Factual Report of Investigation.

At 1105:15, the controller instructed, "eight one whiskey maintain one thousand six hundred turn right heading two one zero". The pilot replied, "two one zero and sixteen hundred". At 1105:33, the controller advised, "november eight one whiskey I'm gonna bring you I'll have a right turn for you back towards the airport in about three more miles." At 1105:38, the pilot replied, "eight one whiskey three more miles right turn". At 1105:18, the controller transmitted, "november eight one whiskey turn right heading zero four zero". The pilot acknowledged the transmission. At 1107:18, the controller transmitted, "november eight one whiskey you should be in a right a right turn to zero four zero". The pilot then advised that he would make a right turn to the heading. At 1107:27, the controller replied, no keep the heading eight one whiskey make a left turn now cause you're already doing it go left a left turn for three three zero". The pilot repeated the heading.

At 1108:10, the pilot advised, "eight one whiskey's coming around to three three zero sixteen hundred feet one point six". At 1108:15, the controller replied, thank you I'll have a turn for you in a moment to go northbound for eight ah eight one whiskey". The pilot requested that the transmission be repeated. At 1108:24, the controller transmitted, "eight one whiskey fly heading three four zero the airport twelve o'clock (two) miles". At 1108:30, the pilot replied, "three four zero four miles and ah I'll go down to a thousand and see if I can get it if not I'll go to my alternate which is Baltimore Martin". At 1109:26, the controller inquired, "eight one whiskey what's your heading at this time". At 1109:30, the pilot replied, "eight one whiskey on a one four----.2" At 1109:36, the pilot advised, "(unintelligible) sir I ah went down to a ----".

At 1109:41, the controller replied, "okay eight one whiskey we're not going to be able to get you into that airport climb and maintain three thousand fly heading one eight zero". At 1109:49, the pilot transmitted, "going to Baltimore Martin right". At 1109:51, the controller replied, "eight one whiskey affirmative maintain three thousand feet". There was no reply from the pilot. At 1110:15, the F-2 controller again transmitted, "november eight one whiskey your altitude's three thousand feet fly heading of one seven zero". Again, there was no response from the pilot. At 1110:25 and at 1111:00, the radar controller attempted to establish communications with the pilot of N2881W without success. Although the pilot did transmit his callsign at 1111:19, further attempts to communicate with the pilot were not responded to. (See ATC Factual Report of Investigation).

After the accident, the ATC facility conducted certifications for the primary and secondary radio transmitters and receivers. In addition the radar system, the beacon system, ARTS, and voice recording system were inspected and certified. All equipment was found to be operating normally and within prescribed tolerances.

CONTROLLER INTERVIEWS

On October 8, 1996, the Controller, Mr. Jenkins, was interviewed. In response to questions, he provided the following information:

He got up on October 2 around 0500 EDT and arrived at work about 0600 EDT. He prepared a written statement concerning the accident shortly after he was relieved from position on October 2. Prior to working at the radar position, he had been on a break, which had lasted about 15 to 20 minutes. He knew that National was conducting ILS approaches to runway 36 and that Andrews was conducting ILS approaches, but he could not recall to what runway. He did not request or solicit any pilot reports while on position. He described the weather as, "not good" and was aware there were IMC conditions.

He was aware that the Hyde airport did not have an instrument approach. When asked that given the existing weather conditions, how he expected to provide a visual approach to the pilot of N2881W, he said that he wasn't going to, but rather his instructor had asked the pilot about a visual approach to the airport. His intent was to get the airplane in the vicinity of the airport and hope that the pilot would cancel his IFR. However, he went on to note that he did not think that there was much of a chance that would occur, but because the pilot had requested it, he would let him do it. On vectors to the airport, he was aware that the lowest altitude that could be issued to the pilot was 1,600 feet. The lowest altitude he issued to the pilot was 1,700 feet. (Alex had issued the lower altitude.) When asked if he had observed the airplane at an altitude lower than 1,600 feet, he said that he did not. He said that he was not aware of any visual MSAW alert, nor did he hear an aural MSAW alert concerning the aircraft. He said that until the interview, he was not aware that 5 MSAW warnings had been generated on this airplane and it was the first time that he had heard that.

On October 8, 1996, the Controller, Mr. Ewings, was interviewed. In response to questions, he provided the following information:

He said that ceiling, visibility and altimeter are the basic weather information that must be given to a pilot. He recalled the pilot stating at 1105:12 that he was in IMC conditions. He said that he did not hear the pilot advise that he would descend to an altitude of 1,000 feet until after he listened to the tapes. When asked why he had not heard it, he said that they were busy doing other things, working other aircraft and coordinating on the land lines. When asked where he was physically located when the transmission was made, he said that he was sitting to Ron's immediate right at an adjacent radar display. He said that to his knowledge, 1,600 feet is the lowest altitude that can be issued to an aircraft over the Hyde airport.

On the day of the accident, he had to pay strict attention to Ron and to watch him closely. After a review of the draft transcript, he said that when he made a transmission at 1109:42, the aircraft was displayed as a primary target with the data block in coast. He said that the last observed mode C before the target went into coast was either 1,400 or 1,600. Before the target

went into coast, he did not hear or observe a low altitude alert associated with this airplane. He also did not observe or hear any alerts prior to the aircraft going into coast with the exception of one, which occurred prior to N2881W entering their airspace. When asked, if the alerts had been generated, what might have precluded them from observing or hearing the alerts? He said that he did not remember hearing or seeing a low altitude alert that was associated with N2881W nor could he speculate on why he did not. When asked if anyone had questioned what the airplane was doing prior to going into coast he said, no.

From the time the airplane was issued an altitude of 1,600 until the time the data block went into coast, he could not recall any type of aural or visual low altitude alerts generated on another aircraft. When asked what portions of the recorded voice communications were reviewed when he listened to bits and pieces the day before, he said 1100:00, 1100:41 and 1108:30. When asked if it had been pointed out to him that the MSAW aural alarm can be heard in the background of the recorded voice communications, he said yes and that the FAA's general counsel, Mr. Wiegand had pointed this out to him. He again stated that he did not hear any type of aural alarm and offered that it might have been generated on another aircraft. It was then pointed out to him that he had earlier stated that no other aircraft had generated any type of low altitude alerts. He did not offer a response.

Minimum Safe Altitude Warning (MSAW) System

The MSAW system was examined an found to be a software program that was a part of the automated radar tracking system (ARTS). It was designed to provide an aural and visual alarm to the controller if an aircraft under their control descended to an altitude, which put it in close proximity to terrain or obstacles. These warnings are shown on a Teletype printout of data that is generated by the ARTS. A review of the Teletype indicated that 4 general terrain warnings (GTW) were generated for the accident airplane N2881W after the pilot advised that he would be descending to an altitude of one thousand feet.

In addition, during a tour of the control room, it was observed that the MSAW speaker had a paper cover over it, taped in place with what appeared to be masking tape.

MEDICAL/PATHOLOGICAL INFORMATION

There was no Autopsy performed. A Postaccident toxicological examination was performed by the Federal Aviation Administration (FAA) Civil Aeromedical Institute, in Oklahoma City, Oklahoma. The toxicology report was negative for Carbon Monoxide, Cyanide, Ethanol and drugs.

ADDITIONAL INFORMATION

A diskette containing pertinent radar data was obtained from the FAA Washington National Facility. The last 10 minutes and 57 seconds of secondary data (time, range, azimuth and altitude) from the Andrews Air Force Base radar site were extracted from the diskette for

N2881W from 11:00:03 at 4900 feet (ft) above mean sea level (msl) to 11:11:00 at 800 ft msl. A primary return (reflection of radar signal which indicates a two dimensional position is space - range/azimuth) at 11:11:05 from the Andrews Air Force base radar site was extracted from the diskette and assumed to represent N2881W. (See Attachment).

As a result of this investigation the Safety Board issued six (6) safety recommendations to the Federal Aviation Administration on April 16, 1997: See Recommendation Letter.

Pilot Information

Certificate:	Commercial	**Age:**	71,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:**	September 14, 1996
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1732 hours (Total, all aircraft), 450 hours (Total, this make and model), 1732 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N2881W
Model/Series:	PA-32-300 PA-32-300	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32-7940180
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 1, 1996 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1290 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-K1G5
Registered Owner:	LEILA SCHOTT	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DCA ,16 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	11:09 Local	**Direction from Accident Site:**	256°
Lowest Cloud Condition:	400 ft AGL	**Visibility**	2 miles
Lowest Ceiling:	Overcast / 1000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	2 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	17°C / 16°C
Precipitation and Obscuration:	N/A - None - Haze		
Departure Point:	SOMERVILLE (N52)	**Type of Flight Plan Filed:**	IFR
Destination:	CLINTON (W32)	**Type of Clearance:**	IFR
Departure Time:	09:00 Local	**Type of Airspace:**	

Airport Information

Airport:	WASHINGTON EXEC-HYDE ARPT W32	**Runway Surface Type:**	Asphalt
Airport Elevation:	249 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:	3000 ft / 60 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	38.689517,-76.850715(est)

Administrative Information

Investigator In Charge (IIC):	Wilson, Butch
Additional Participating Persons:	BOB MOLTEN; WASHINGTON , DC DANIEL V MCANALLY; WASHINGTON , DC EDWARD G ROGALSKI; BELLEVIEW , FL ROBERT T DADDAIN; WASHINGTON , DC
Original Publish Date:	March 31, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=28118