Aviation Investigation Final Report

Location:	Lake Pleasant, Arizona	**Accident Number:**	LAX07FA160
Date & Time:	May 11, 2007, 20:03 Local	**Registration:**	N512DS
Aircraft:	Diamond Aircraft Industries DA 40	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot telephoned an acquaintance who was boating on a lake, and informed him that he planned to overfly the lake. At the end of the evening's civil twilight, witnesses observed the airplane approach the lake. The pilot telephoned the acquaintance and asked him to shine a light toward the airplane to facilitate being located on the lake. Other recreational boaters in the vicinity reported observing the airplane perform low altitude maneuvers, including a steep pull-up and a 70-degree angle bank. Witnesses estimated that some maneuvers were performed within a wingspan or two above the lake. The witnesses said the engine was not sputtering and sounded "real strong." During one of the buzzing maneuvers, the airplane descended into the lake, fragmented, and sank. The accident occurred minutes after the end of civil twilight with a marginally visible horizon. A majority of the wreckage, to include the engine, was not recovered.

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 sufficient altitude above the surface of water during an intentional buzzing maneuver. Contributing to the accident was the nighttime lighting environment.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings
1. (F) LIGHT CONDITION - NIGHT
2. TERRAIN CONDITION - WATER
3. (C) BUZZING - INTENTIONAL - PILOT IN COMMAND
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On May 11, 2007, about 2003 mountain standard time, a Diamond Aircraft Industries, Inc., DA 40, N512DS, performed a low altitude maneuver during which it descended into Lake Pleasant, Arizona. The airplane's structure fragmented upon impact, and the airplane sank. Upon its subsequent recovery, the airplane was found destroyed. The pilot held an airline transport pilot certificate, and he and the non-pilot passenger were killed. Southwest Flight Center, Scottsdale, Arizona, operated the airplane. The operator's owner and the pilot's family reported to the National Transportation Safety Board investigator that the purpose of the flight was pleasure. Visual meteorological conditions prevailed at the time of the nighttime flight, and no flight plan had been filed. The flight was performed under the provisions of 14 Code of Federal Regulations Part 91, and it originated from Scottsdale, about 1946.

The operator's owner reported to the Safety Board investigator that the pilot had rented the airplane for the evening flight. The pilot had previously been checked out to fly the airplane.

The Federal Aviation Administration (FAA) provided the Safety Board investigator with radar data that shows the airplane's flight path from Scottsdale to Lake Pleasant. The track shows the airplane generally flying in a northwesterly direction from Scottsdale toward Lake Pleasant. The radar shows the airplane crossing over the southern portion of the lake, where the New Waddell dam is located. Thereafter, the radar track terminates.

An acquaintance of the pilot reported to a Maricopa County Sheriff's deputy and the FAA coordinator that about 1855 he received a phone call from the pilot. The pilot stated that he was going to overfly the lake and desired to locate the acquaintance in his boat. At 1954, the pilot called and asked him to shine a light so he could see the boat. The pilot subsequently flew over the boat two or three times. The pilot called again at 2002, and asked him to shine the light again. As the witness reached for the light, he turned toward the sound of the approaching airplane. He observed the airplane "making a hard banking right-hand turn at a steep angle" whereupon the airplane flew into the lake about 150 feet from the witness.

Several other witnesses, who were not acquainted with the pilot, also reported their observations. One witness said that he was located at the south end of the lake, just east of the Waddell Dam, when he heard and saw an airplane approaching the dam. The airplane was flying in a northerly direction. The airplane crossed the dam at a low altitude, estimated as two wingspans above the dam. The witness stated "I thought it strange that it had no lights on." Thereafter, the airplane descended to about 1.5 wingspans over the lake and then it made a left counterclockwise turn to reverse direction. After a few seconds, while the airplane was flying in a southerly direction toward his position, it suddenly "pulled straight up." He saw the

belly of the airplane. The airplane climbed about 6 or 7 wingspans and then pivoted on its right wing, like in a hammerhead turn, and descended until he lost sight of it and stopped hearing its engine. The witness never saw or heard the airplane again. Until this point, the entire time he watched the airplane its engine sounded fine. Its tone was constant. It was "not sputtering" and its "motor sounded real strong."

A witness, who is a pilot and who was in a boat on the lake, reported that he observed an airplane with no lights flying in a northerly direction approximately 150 above the top of the dam. When the airplane was north of the dam it descended to about 30 feet above the water. The witness observed the airplane make at least a left 70-degree angle bank, and during the turn the left wing tip could not have been more than 20 feet above the water. About 2 seconds before the witness lost sight of the airplane he heard the engine's rpm increase.

Additional recreational boaters on the lake also reported observing the accident airplane flying at low altitudes while maneuvering. A search for the airplane and its occupants commenced within seconds after the crash. Responding boaters noted a strong odor of fuel in the water. Neither the occupants of the airplane nor the main wreckage was located for several days following the accident.

PERSONNEL INFORMATION

The pilot, age 45, held an airline transport pilot certificate for airplane multiengine land, with commercial pilot privileges for airplane single engine land. He held type ratings for the CE-500 (Cessna Citation) and the SD-3 (Shorts).

The pilot reported on an application for an aviation medical certificate, issued May 2006, without limitations, that his total flight time was 10,000 hours. The pilot's personal flight record logbook was not provided to the Safety Board investigator for examination.

On the operator's "Pilot Data" form, which accompanied an airplane rental application dated February 19, 2006, the pilot reported 9,700 hours of total flight time, and accomplishment of a flight review on September 1, 2005.

In 1996, the FAA suspended the pilot's certificate for 120 days for a 1995 drug-related offence. Also, the pilot had convictions for driving with a suspended license (2000 and 2004) and for another drug paraphernalia violation (2004).

AIRCRAFT INFORMATION

The airplane was manufactured in 2006, and it was maintained by the operator on an annual and 100-hour inspection basis. A review of the airframe, engine, and propeller logbooks was performed. The FAA coordinator reported finding compliance with applicable regulations.

The airplane's engine had a history of excessive rpm loss, and it received maintenance to

address the problem. For example, on April 26, 2007, at a tachometer time of 75.1 hours, the following remark was written in the maintenance record: "Excessive Mag Drop." The record further indicates that the problem was resolved. Also, on May 11, 2007, at a tachometer time of 92.3 hours, the same remark was written in the maintenance record. This discrepancy was addressed by the operator through replacement of the left magneto, which was believed defective.

Thereafter, at a tachometer time of 92.4 hours, the airplane was returned to service. The accident pilot flew the airplane later during the day.

METEOROLOGICAL INFORMATION

The closest aviation weather observation station to the accident site is located at the Deer Valley Airport, about 16 miles southeast. In pertinent part, at 1953, Deer Valley reported the following weather: sky clear; visibility 10 miles; surface wind from 290 degrees at 3 knots; and temperature 34 degrees Celsius.

According to the U.S. Naval Observatory, civil twilight ends in the evening when the center of the Sun is geometrically 6 degrees below the horizon. This is the limit at which twilight illumination is sufficient, under good weather conditions, for terrestrial objects to be clearly distinguished. At the end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under good atmospheric conditions in the absence of moonlight or other illumination. Complete darkness begins sometime after the end of evening civil twilight.

On May 11, the end of civil twilight occurred about 1947. The crescent moon was not visible, having set hours prior to the accident.

COMMUNICATION

According to the FAA, a search of nearby FAA facilities did not reveal evidence that any air to ground communications or services had been provided to the accident pilot following departure from Scottsdale.

WRECKAGE AND IMPACT INFORMATION

Maricopa County sheriff's deputies identified the general areas in the main bay of Lake Pleasant (Lake Pleasant Regional Park) where wreckage was located. The areas were noted using coordinates from a global positioning system receiver. The coordinates were hand copied by a sheriff's representative and provided to the Safety Board investigator.

Wreckage was found in the southern portion of the lake, about 1.4 miles northwest of the dam. The principal debris field encompassed an oval shaped area about 100 feet wide by 150 feet long. Within this area the water depth ranged from 109 to 114 feet, and the lake's bottom was soft and silty. The majority of sections of the cockpit, tail, and wings were located in this area

along with the pilot and passenger, who were found in the cockpit.

The Safety Board investigator performed an examination of recovered portions of wreckage. The propeller, engine, portions of the cockpit, most of the instrument panel and cabin, the left aileron, and the entire tail were not recovered by the airplane owner's agent, despite a search.

In summary, no evidence of fire (signatures of heat distressed components) or oil residue was noted on the surface of any skin or component. The center sections of both wings were found attached to the fuselage center section. The outboard tip portion of the left wing (red navigation light) was located undamaged, although the tip was broken from the inboard wing section. The outboard portion of the right wing was not recovered.

The fuel selector handle was found positioned to the left tank. The elevator trim control and the engine control levers were found in the cockpit. Their respective cable connections exhibited tension overload (broomstraw) signatures.

The left and right control sticks were found attached with their respective fittings in the cockpit; no evidence of control stick disconnection was found. The continuity of the flight control system was not confirmed due to the severity of the fragmentation and the lack of recovered components.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot held a first-class aviation medical certificate that was issued in May 2006, without limitations. Family members reported that the pilot was not physically handicapped and was in good health.

An autopsy was performed on the pilot by the Maricopa County Medical Examiner, Phoenix, Arizona. The listed cause of death was "multiple injuries."

Toxicology samples for the pilot were submitted to the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. The toxicology results were negative for drugs of abuse. Ethanol, N-butanol and N-propanol were detected in specimens of liver and muscle. The pilot's body had remained submerged in the lake for several days following the accident. As indicated in the toxicology report, the samples exhibited putrefaction.

ADDITIONAL INFORMATION

The FAA's VFR Terminal Area Chart for Phoenix shows a solid identification line encompassing the Lake Pleasant area. A note on the chart indicates that the depicted location is a "Bald Eagle Breeding Area." The following note is associated with the identification line on the chart's ledged: "All aircraft are requested to maintain a minimum altitude of 2,000 feet above the surface...."

Pilot Information

Certificate:	Airline transport	**Age:**	45,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Unknown
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 1 Without waivers/limitations	**Last FAA Medical Exam:**	May 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 1, 2005
Flight Time:	9700 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Diamond Aircraft Industries	**Registration:**	N512DS
Model/Series:	DA 40	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	40.622
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 1, 2007 Annual	**Certified Max Gross Wt.:**	2535 lbs
Time Since Last Inspection:	93 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	93 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	IO-360 MIA
Registered Owner:	AIR EP, LLC	**Rated Power:**	180 Horsepower
Operator:	Southwest Flight Center	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	DVT,1478 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	19:53 Local	**Direction from Accident Site:**	125°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.8 inches Hg	**Temperature/Dew Point:**	34°C / -5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Scottsdale, AZ (SDL)	**Type of Flight Plan Filed:**	None
Destination:	(SDL)	**Type of Clearance:**	None
Departure Time:	19:46 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	33.874168,-112.287498

Administrative Information

Investigator In Charge (IIC):	Pollack, Wayne
Additional Participating Persons:	Craig Roberts; Federal Aviation Administration; Scottsdale, AZ
Original Publish Date:	June 30, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65774