		NTSB ID: LAX01FA055		Aircraft Registration Number: N739HB	
		Occurrence Date: 12/09/2000		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place PETALUMA		State CA	Zip Code 95433	Local Time 1927	Time Zone PST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility: 4			
Aircraft Information Summary					
Aircraft Manufacturer Cessna		Model/Series TR182/TR182		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
HISTORY OF FLIGHT					
<p>On December 9, 2000, about 1927 Pacific standard time, a Cessna TR182, N739HB, descended into rising hilly terrain about 3.5 nautical miles (nm) east-northeast of the uncontrolled Petaluma Municipal Airport, Petaluma, California. The airplane was destroyed. The instrument rated private pilot, who owned and operated the airplane, was fatally injured. Instrument meteorological conditions prevailed, and an instrument flight plan had been filed. The personal flight was performed under 14 CFR Part 91, and it originated from San Carlos, California, about 1803.</p>					
<p>An acquaintance of the pilot reported to the National Transportation Safety Board investigator that during the accident flight the pilot had planned to practice instrument flying. The Federal Aviation Administration (FAA) reported that the pilot departed from San Carlos on an instrument flight rules (IFR) flight plan and flew to the Napa County Airport.</p>					
<p>About 1916, the pilot departed Napa on an IFR flight plan to Petaluma. The pilot was cleared to cross over the Scaggs Island navigation aid (VORTAC) at 3,000 feet msl, and thereafter, proceed via the Scaggs Island 276-degree radial directly to the AFTIN Intersection (final approach fix) and then to the Petaluma Airport.</p>					
<p>At 1919, the radar controller issued the pilot an IFR clearance to perform the VOR/DME Runway 29 approach to Petaluma. The pilot acknowledged the clearance by stating "...cleared for the approach." Also, the pilot stated that he planned to make a full stop landing.</p>					
<p>As the airplane approached Petaluma at 1923, the controller terminated radar services and advised the pilot to change to the airport's advisory frequency. The controller advised the pilot that no other traffic was observed in the area. The pilot acknowledged the instruction. There were no further communications recorded from the pilot. No witnesses reported observing the airplane accident.</p>					
PERSONNEL INFORMATION					
<p>In 1960, the pilot was issued a private pilot certificate with the following ratings and limitations: airplane single engine land. In June, 2000, the pilot was issued an instrument rating.</p>					
<p>Based upon a review of the pilot's aviation medical record application forms and partial flight logbook records, by the accident date his total flight time was approximately 975 hours. His total dual instruction received was 325 hours, his total simulated and actual instrument flight times were 146 and 86 hours, respectively. The pilot's estimated total experience flying the accident make and model airplane was 519 hours.</p>					
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FACTUAL REPORT

AVIATION

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Occurrence Date: 12/09/2000

Occurrence Type: Accident

Narrative (Continued)

AIRPLANE INFORMATION

The airplane was equipped for flight under IFR. During the accident flight, the pilot had with him a "handheld" GPS receiver. The FAA had not approved its use for navigation under IFR.

An examination of the airplane's maintenance records did not reveal any discrepancies, according to the FAA participant. The airplane's VOR navigation receiver was last checked for accuracy on June 10, 2000.

METEOROLOGICAL INFORMATION

Petaluma's airport manager described the local weather conditions between 1930 and 2130 as being "pea-soup drippy fog." He additionally stated that there was an indefinite ceiling with visibility between 1/4 and 1/2 mile and no wind during that time.

A certified flight instructor, who was speaking at an airport function that evening from approximately 2030 to 2130, recalled the weather as being misty to rainy. An airline pilot speaking at the same function described the weather on her arrival at 2050 as misty with light drizzle. She also stated that it was raining on her departure at 2130.

Aviation weather observation stations located at Santa Rosa, elevation 125 feet msl, and Napa, elevation 35 feet msl, reported the following weather conditions:

At 1933, Santa Rosa reported its surface wind was calm; visibility was 2 1/2 miles in mist; broken ceiling at 700 feet above ground level (agl); overcast at 1,600 feet agl; temperature/dew point of 11/11 degrees Celsius; and altimeter 30.04 inHg.

At 1854, Napa reported its surface wind was 260 degrees at 5 knots; visibility was 3 miles in mist; scattered clouds at 1,500 feet agl; overcast ceiling at 3,000 feet agl; temperature/dew point of 12/11 degrees Celsius; and altimeter 30.04 inHg.

AIDS TO NAVIGATION

According to the FAA, all electronic aids to navigation pertinent to the airplane's route of flight were functional on the day of the accident.


AIRPORT, GROUND FACILITIES AND INSTRUMENT APPROACH INFORMATION

According to the Petaluma Airport manager, on the evening of the accident, the airport's runway lights and rotating beacon were operating. The manager reported that these lights operate continuously between dusk and dawn.

The airport's elevation is 87 feet msl. In addition to the VOR/DME Runway 29 instrument approach procedure (IAP) that the FAA published for use at the airport, the FAA also published a GPS Runway 29 IAP, and a couple of other approach procedures.

According to the VOR/DME Runway 29 IAP chart, the minimum descent altitude (MDA) for a straight-in approach is 1,120 feet msl. The prescribed course from the initial approach fix at the Scaggs Island VORTAC to the final approach fix (AFTIN intersection), and then to the airport, is 276 degrees. The minimum altitude crossing the final approach fix is 1,900 feet msl.

Regarding the GPS approach, the MDA is 900 feet msl. The final approach course between the IPARY waypoint and the airport is 290 degrees.

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Narrative (Continued)

WRECKAGE AND IMPACT INFORMATION

The crash site was located about 3.48 nm and 240 degrees, magnetic, from the Petaluma Airport, at an estimated elevation of 1,020 feet mean sea level (msl). The global positioning satellite (GPS) coordinates for the crash site are 38 degrees 16.338 minutes north latitude by 122 degrees 32.043 minutes west longitude. This location corresponds to the airplane being on the 291-degree radial and about 9.43 nm from the Scaggs Island VORTAC navigational aid, which serves as the initial approach fix.

The airplane was found on (estimated) 30-degree upsloping, grass-covered hillside in an upside down attitude, on a magnetic heading of about 035 degrees. The entire airplane was found at the accident site. There was no evidence of fire.

The principle axis of the wreckage distribution path was about 291 degrees. The first airplane component found along the wreckage distribution path was the nose strut's shimmy dampener. The remainder of the nose gear and wheel assembly was found separated from the airplane and was located a few yards downslope. The airplane's marker beacon antenna was found in the initial point of impact (IPI) crater several feet northwest of the shimmy dampener. The distance between the IPI and the main wreckage was about 43 feet.

The leading edges of both wings were crushed in an aft direction. All flight control surfaces were found attached. The upper portion of the right wing lift strut was found separated from the wing. The three other lift strut attachment points were found intact. The cockpit was crushed.

Over 5 gallons (estimated) of fuel was found in the right wing. Rescue personnel who were first responders to the scene verbally reported observing fuel dripping from the airplane. The airplane's altimeter was observed set to 30.02 inHg.

Two IAP charts were found on the pilot's kneeboard, according to law enforcement personnel. The charts were the Petaluma GPS Runway 29 approach and the Petaluma VOR Runway 29 approach. The same personnel reported that the GPS approach plate was the one visible on top of the kneeboard.

MEDICAL AND PATHOLOGICAL INFORMATION

On December 11, 2000, an autopsy was performed on the pilot by the Sheriff-Coroner in Sonoma County, California. Toxicological tests were performed on specimens from the pilot by the FAA's Bioaeronautical Sciences Research Laboratory, in Oklahoma City, Oklahoma. The manager reported no evidence of carbon monoxide or ethanol in blood and vitreous. However, the following drugs were detected in the pilot's blood and urine: Paroxetine (0.619 ug/mL in blood) and Mirtazapine (0.142 ug/mL in blood). Also, ephedrine, pseudoephedrine, and phenylpropanolamine were found in blood and urine.

According to the FAA, use of a psychotropic drug can impair performance and is considered disqualifying for the issuance of an aviation medical certificate. The pilot did not indicate the use of these drugs on his last application for the medical certificate.

TESTS AND RESEARCH

Engine and Airframe Examination.

The Safety Board investigator supervised the partial engine teardown and airframe examination. In pertinent part, the engine participant reported that the spark plugs were in a "like new" condition and were a normal combustion grayish color. The vacuum pump drive shaft coupling was found intact.

The crankshaft was rotated, and the internal continuity was established with all gears and to the

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valve train. Compression was detected in all cylinders. Fuel was found in the fuel lines, carburetor and in the engine driven fuel pump. The turbocharger rotated freely. The magnetos sparked at all leads during rotation by hand of the drive shaft. The induction and exhaust systems were clear.

The propeller was observed scratched in a chordwise direction, and it was torsionally twisted. The continuity of the flight control system was confirmed.

Avionics Examination.

Six pieces of navigational equipment (radios and navigation receivers) were removed from the airplane wreckage and were examined by an FAA certificated repair station. In summary, the impact damaged receivers were examined to determine if they were accurately calibrated or had exhibited any anomalies. In particular the frequencies and radials associated with the Petaluma VOR/DME Runway 29 instrument approach were selected for bench testing. In general, the receivers were found to be at or near the required limits.

NTAP AND GPS Track Data.

According to FAA recorded radar data from its National Track Analysis Program, during the last 2 minutes of the airplane's recorded flight, it descended from 2,000 feet to 1,000 feet. The last radar hit was at 1927:02.

A handheld global positioning satellite receiver was recovered from the cockpit. It was identified as a Garmin model GPSMAP295. The GPS receiver was impact damaged; its display screen was broken.

The receiver was taken to its manufacturer where stored data was recovered. In pertinent part, approximately 38 user-defined waypoints, 6 flight plans, and 1,900 track points were extracted from the receiver memory.

The identifications for the user-defined stored waypoints were compared with the identifications for the waypoints and fixes associated with the FAA published VOR/DME runway 29 and the GPS runway 29 instrument approved procedures for Petaluma. No matches were found. Also none of the stored flight plan routes corresponded with the route between Napa and Petaluma. Four series of sequentially recorded track points were noted. The series bore starting dates of November 27, 29, and 30, 2000, and December 9, 2000.

An examination of the series of 506 track points dated December 9 revealed they originated in the vicinity of the San Carlos Airport and terminated near the crash site. In pertinent part, the track points indicated that at 9:16:58 the airplane was located on runway 24 at the Napa County Airport. (The hour time reference, being 9, is 2 hours later than the actual occurrence time.) The airport's elevation is 33 feet msl. The GPS recorded an elevation of 18 feet. At 9:17:31, the airplane's speed was 90.2 mph, the GPS altitude was 275 feet, and the ground track was 242 degrees magnetic. About 9:20:53, after tracking an average 236-degree magnetic course over 5.1 nm, the airplane passed abeam the Scaggs Island VORTAC, and the GPS altitude was 2,970 feet. The airplane's track then changed. During the next approximately 6.8 miles its average ground track was about 292 degrees. By 9:25:24, the airplane had descended to a GPS altitude of 1,836 feet. At this time it was passing about 1.9 miles north-northeast of the AFTIN Intersection.

AFTIN is the final approach fix for the instrument approach for which the pilot had been cleared. The published course from Scaggs Island, to AFTIN Intersection, and to the Petaluma Airport is 276 degrees. The minimum published crossing altitude at AFTIN is 1,900 feet msl. The airplane continued descending, and its last recorded GPS altitude was 981 feet, at a ground speed of 91.9 mph.

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Narrative (Continued)


The accident site was about 12 feet from the last recorded GPS position. This location was about 2.2 nm northeast from the prescribed final approach course.


STABILIZED FLIGHT PATH PROFILE

To visualize the airplane's flight path including its pitch, bank and yaw axis, along with g-loading during its final approach into the terrain, the recorded GPS track points were uploaded into a software program by UHL Research Associates, Inc. The Safety Board investigator viewed the program's output in a real time 3-D mode. No excursions from a stabilized flight profile were detected; all bank angles and heading changes were about 20 degrees or less during the last minute of flight.

ADDITIONAL INFORMATION

The airplane wreckage was verbally released to the recovery agent for the airplane owner's insurance company on December 28, 2000.

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Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Petaluma	O69	87 Ft. MSL			
Runway Surface Type: Unknown					
Runway Surface Condition: Unknown					
Approach/Arrival Flown: VOR/DME					
VFR Approach/Landing: Unknown					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
Cessna		TR182/TR182		R18200998	
Airworthiness Certificate(s): Normal					
Landing Gear Type: Tricycle					
Amateur Built Acft? No	Number of Seats: 4	Certified Max Gross Wt.	3100 LBS	Number of Engines: 1	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Reciprocating	Lycoming	O-540-L3C5D	235 HP		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Annual	11/2000	28 Hours	1709 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type Yes /	ELT Operated? Yes	ELT Aided in Locating Accident Site? Yes			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
Colin L. and Johnna L. Fox, Trustees		City	State	Zip Code	
		San Carlos	CA	94070	
Operator of Aircraft		Street Address			
COLIN L. FOX		City	State	Zip Code	
		BURLINGAME	CA	94010	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Personal					

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First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 65
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Sex: M	Seat Occupied: Left	Occupational Pilot? Doctor/Dentist	Certificate Number: On File
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Certificate(s): Private

Airplane Rating(s): Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Current Biennial Flight Review? 03/2000

Medical Cert.: Class 3	Medical Cert. Status: Invalid Medical for flight	Date of Last Medical Exam: 06/2000
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	975	519	975		137	86	146			
Pilot In Command(PIC)	650	250	825		80					
Instructor										
Instruction Received										
Last 90 Days	36	36	36		18	8				
Last 30 Days	17	17	17		9	7				
Last 24 Hours	1	1	1		1					

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? Yes	Second Pilot? No
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Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point NAPA	State CA	Airport Identifier APC	Departure Time 1916	Time Zone PST
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Destination Local Flight	State	Airport Identifier O69	
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Type of Clearance: IFR

Type of Airspace: Class G

Weather Information

Source of Wx Information:

Unknown


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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
STS	1933	PST	125 Ft. MSL	19 NM	301 Deg. Mag.
Sky/Lowest Cloud Condition:				Ft. AGL	Condition of Light: Night/Dark
Lowest Ceiling: Obscured			Ft. AGL	Visibility: 0 SM	Altimeter: 30.04 "Hg
Temperature: 11 °C	Dew Point: 11 °C	Weather Conditions at Accident Site: Instrument Conditions			
Wind Direction:		Wind Speed:		Wind Gusts:	
Visibility (RVR): Ft.		Visibility (RVV) SM			
Precip and/or Obscuration:					

Accident Information		
Aircraft Damage: Destroyed	Aircraft Fire: None	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot	1				1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -	1				1
Other Ground	0	0	0		0
- GRAND TOTAL -	1	0	0		1

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Administrative Information

Investigator-In-Charge (IIC)
WAYNE POLLACK

Additional Persons Participating in This Accident/Incident Investigation:

JENNIFER ADAIR
FAA WP-FSDO
Oakland, CA

Robert August
Cessna Aircraft Company
Wichita, KS

Jeff Poshwatta
Lycoming Engines
Kent, WA