Aviation Investigation Final Report

Location:	SOLDOTNA, Alaska	**Accident Number:**	ANC99FA070
Date & Time:	June 5, 1999, 10:35 Local	**Registration:**	N61609
Aircraft:	Cessna A185F	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal, 3 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The private pilot was landing the float equipped airplane on choppy water with a left-quartering headwind of 10 knots. The airplane landed hard on the left float, bounced into the air, and landed on the right float. The right wing contacted the water, and the airplane nosed over, coming to rest with the left wing submerged and the right wing pointed into the air. The three passengers on board released their seatbelts, and exited the right cabin door. Both the pilot and the right-front seat passenger were unable to locate, release, or cut the pilot's seatbelt. The pilot was described by one passenger as 'awake, and alert, and fully cognizant of the situation; able to cooperate but unable to complete the task for whatever reason.' The airplane slowly rolled inverted and remained afloat. The passengers, and a rescuer from shore, were unable to open the pilot's locked door, or remain submerged in the 40 degree Fahrenheit water. The diver who removed the pilot told the NTSB investigator-in-charge that when he released the pilot's seatbelt, the pilot was removed without difficulty. Postaccident inspection by the IIC revealed that once unlocked, the door could be opened normally. Reaching the pilot's door handle required the occupant to twist his torso to the left, and reach behind his shoulder. The pilot's seatbelt release buckle could be opened with one hand and less than 10 pounds of force. The pilot's buckle was located aft of his left hip, and sandwiched between the left door and the seat. With the door closed, the seatbelt buckle was masked under the door armrest. The Cessna inertial reel, seatbelt/shoulder harness assembly was installed according to the manufacturer's specifications. FAA Advisory Circular AC-21-34 states in part: 'A proper installation geometry for the diagonal shoulder harness positions the shoulder belt so that it passes over the midpoint of the shoulder, with the lower end fastened well to the side of the occupant's hip.' Toxicology tests revealed the presence of phentermine, a prescription stimulant, similar to amphetamines, was present in the pilot's blood and urine. No record of a prescription was found. The pilot was a pharmacist. The Physician's Desk Reference contains the following contraindications regarding phentermine: '...agitated states...phentermine hydrochloride may impair the ability of the patient to engage in potentially hazardous activities such as operating a motor vehicle; ...Caution is to be exercised in prescribing...for patients with

even mild hypertension.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The improper recovery from a bounced water landing by the pilot. Factors associated with this accident were the pilot's failure to release his seatbelt due to the obstructed location of the pilot's seatbelt buckle.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) RECOVERY FROM BOUNCED LANDING - IMPROPER - PILOT IN COMMAND
2. USE OF INAPPROPRIATE MEDICATION/DRUG - PILOT IN COMMAND

Occurrence #2: NOSE OVER
Phase of Operation: LANDING - ROLL

Findings
3. (F) MISC EQPT/FURNISHINGS,SEAT BELT - OBSTRUCTED
4. (F) SEAT BELT - NOT REMOVED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On June 5, 1999, at 1035 Alaska daylight time, a Cessna A185F float equipped airplane, N61609, sustained substantial damage during landing on Longmare Lake, about four miles east of Soldotna, Alaska. The private pilot was fatally injured. The three passengers on board were not injured. The business flight was being operated under 14 CFR Part 91 to a friend's house on Longmare Lake. The flight departed from the pilot's home on Campbell Lake, Anchorage, Alaska, about 1000. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed.

The three passengers, and two witnesses who observed the accident from the shoreline, were interviewed by the NTSB investigator-in-charge (IIC) at the scene on June 5, about 1330. All five persons said the airplane landed in a northerly direction, into a left-quartering headwind of about 10 knots, with light chop on the water surface. The witnesses said the airplane landed hard on the left float, and bounced into the air. The airplane then landed on the right float, the right wingtip contacted the water, and the airplane nosed over. The airplane came to rest with the left wing submerged and the right wing pointing into the air.

The passengers stated that after the airplane came to rest, they released their seatbelts, and escaped through the right side door. They said the pilot remained in his seat, and commented to the passengers that he could not find the buckle to release his seatbelt. They related that the airplane cabin slowly filled with water, sank nose down, and rolled left. Both the pilot, and the right-front seat passenger attempted to cut the pilot's seatbelt, but could not locate it before the airplane rolled inverted. Attempts to open the pilot's door from the outside were unsuccessful. Attempts by two of the passengers, and one witness from shore, to submerge themselves in the 40 degree Fahrenheit water to rescue the pilot were also unsuccessful.

INJURIES TO PERSONS

None of the passengers were injured during the accident sequence. The two rear seat occupants told the IIC they received bruises during their egress through the right cabin door. All three passengers were immersed in 40 degree Fahrenheit water, and became hypothermic.

The passengers stated to the IIC that the pilot appeared uninjured after the accident, although an autopsy performed on the pilot revealed a fracture of the right pelvis, sternum, and one fractured rib. It could not be determined if these injuries were sustained during the impact sequence, or resuscitative efforts. The passenger seated in the right-front seat, who is a medical doctor, said "the pilot was awake, and alert, and fully cognizant of the situation; able to cooperate but unable to complete the task for whatever reason." The pilot was talking to the

passengers as the airplane began to roll to the left and fill with water. They described him as initially agitated, and angry at having damaged his airplane during the landing.

DAMAGE TO AIRCRAFT

The airplane sustained substantial damage to both wings. The cabin and fuselage were undamaged.

PERSONNEL INFORMATION

Pilot:

The pilot held a private pilot certificate with ratings for single-engine land and sea airplanes. He did not hold an instrument rating. His third class medical certificate, issued on October 30, 1998, contained the restriction that he "shall have available glasses for near vision."

According to the pilot's logbook, he had accumulated 2,156 hours of total flight experience at the time of the accident. The IIC was able to verify about 80 hours of flight experience in Cessna 185 airplanes. In the previous 90 days, the pilot had flown 15 hours. In the previous 30 days, he had flown 2 hours. The pilot flew the airplane from the Lake Hood Seaplane Base, Anchorage, to Campbell Lake, on May 30. According to the pilot's wife, he performed three or four takeoffs and landings during this flight. The pilot's most recent previous flight in a float equipped airplane was October 9, 1998. His most recent biennial flight review was conducted on March 29, 1999, in a Piper PA-18 airplane configured with skis.

The night prior to the accident, the pilot went to bed about 2030. On the day of the accident, the passengers arrived at the pilot's house about 0830. They told the IIC that the pilot was awake and having coffee when they arrived.

The pilot was a pharmacist, and occasionally used his airplane to travel on business. He was described as physically active, was 5 feet 10 inches tall, and weighed 201 pounds at the time of the accident. His most recent aviation medical examination indicated his weight to be 211 pounds on October 30, 1998.

Passengers:

The pilot-rated passenger seated in the right-front seat is a medical doctor, and was a friend of the pilot. He was traveling to Soldotna to visit a patient, and agreed to share costs with the pilot, who was also going to visit a customer. He holds a commercial pilot certificate in single-engine land and sea airplanes, and had accumulated about 5,000 hours of flight experience at the time of the accident.

The passenger seated in the right-rear seat is a registered nurse who was traveling with the doctor, her employer.

The pilot-rated passenger seated in the left-rear seat was the brother-in-law of the front-seat passenger. He is a private pilot with about 300 hours of flight experience, and is an airframe and powerplant mechanic with an inspection authorization.

AIRCRAFT INFORMATION

The airplane was a 1981 Cessna A185F. It was equipped with EDO 628-2960 floats, and a Teledyne Continental Motors, IO-550-D3B engine. The engine was configured with a Hartzell PHC-C-3YF-11RF three-bladed propeller. The engine/propeller combination was installed under Bonaire Aviation Company Supplemental Type Certificate (STC) number SA2933SO. According to the most recent aircraft logbook entries, the airplane had accumulated approximately 1610 hours of total time at the time of the accident. A review of the airplane's logbook revealed that a zero time Hobbs meter was installed at 350 hours, but total airframe time did not reflect this change. The actual total time on the airframe at the time of the accident was 1,960 hours. The most recent annual inspection was completed on May 28, 1999, one hour prior to the accident. The airplane had wheels removed, and floats installed, during the annual inspection. Plus 350 for an unaccounted Hobbs change.

The airplane was rebuilt between an accident on August 19, 1996, and its return to service on April 8, 1998. During this rebuild, the original fuselage aft of station 65.33 was joined to a section of fuselage forward of station 65.33 from an unknown model Cessna 185. The right wing of an unknown model Cessna 185 was also attached. The data plate from the original airplane was removed from the damaged forward section, and installed on the front door post of the added fuselage section, using blind, hollow rivets.

The airplane was equipped with a Robertson Short Take Off and Landing (STOL) kit, installed under STC number SA1441WE.

The two front seats were a combination of Cessna front seat assemblies, part numbers 0714025 (infinitely adjustable seats) and 0714024-15 (standard seat for this serial number).

The airplane was equipped with Cessna inertial reel shoulder harness assemblies, part number S2199-19, installed for the front seat occupants. According to a lien filed against the airplane, the seatbelts were installed on June 11, 1986. The female end of the pilot's lap belt had a data tag identifying the belt as Pacific Scientific assembly 1107061. The female end of the pilot's lap belt attached to the floor structure, outboard of the seat. The female belt end remained in a fixed position, regardless of the fore and aft positioning of the seat. The belt webbing was replaced at Aircraft Belts, Inc., of Kemah, Texas, on October 15, 1995. According to representatives of Aircraft Belts, Inc., belt webbing is replaced to the same dimensions as the original.

The pilot's buckle assembly was manufactured by American Safety, manufacturer's number: 1107061. The buckle tab is smooth and straight, with no raised tab at the release end. The

Cessna specification for the length of the female lap belt end is 17.5 inches from the center of the attaching bolt hole, to the face of the buckle. The length of the accident pilot's lap belt was 17.0 inches.

The rear seat passengers were provided with occupant adjustable, single strap, diagonal torso restraints.

METEOROLOGICAL INFORMATION

The closest weather observation station is Soldotna. The reported weather at 1035 was clear skies, 10 miles visibility, and winds from 350 degrees magnetic at 8 knots.

The passengers described the wind on Longmare Lake from the north-northwest about 10 knots. This was initially a headwind, and shifted to a left-quartering headwind during landing.

AERODROME INFORMATION

Longmare Lake measures about 5,000 feet long by 900 feet wide of useable waterway, with the long axis oriented about 170/350 degrees magnetic. The lake makes a gentle bend to the left. The lake is surrounded by homes, several of which have seaplane docks and windsocks.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest floating inverted in fresh water. The IIC, and an FAA airworthiness inspector, conducted an on-site investigation of the airplane about three hours after the accident, immediately after the local fire department dive team righted the airplane and towed it to shore.

The leading edges of both wings were undamaged. The right wing outboard of station 190 was deformed aft about 1 foot. The upper skin on the right wing was wrinkled outboard of the STOL kit stall fence. The left wing was fractured at station 100.5, and folded over the top of the inboard left wing. There was no observed damage to the empennage or tail surfaces.

The trailing edge flaps were extended to the 30 degree position. The water rudders were up.

The propeller had no visible damage, and could be rotated by hand. The magneto impulse couplings could be heard snapping when the propeller was turned. The engine cowling and propeller spinner appeared undamaged.

The spray strip on the inboard side of the left float was peeled up and aft to the forward float spreader bar. The right spray strip was intact and undamaged.

The pilot's seat was adjusted to the midrange height adjustment. The seat was locked in position, with the forward-left edge of the seat snugly set against the left side panel. The seat

was unable to be moved farther forward due to contact between the seat cushion, and the left side panel. The seat was restrained from movement aft by a locking pin installed on the right seat track, behind the seat. Aft movement of the pilot's seat required manual release of the locking pin.

The baggage area, located behind the aft bench seat, contained tiedown ropes, two sets of rubber waders, and one piece of medical equipment. The combined weight of this unrestrained baggage was about 20 pounds.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination was performed by the Alaska State Medical Examiner, 5700 East Tudor Avenue, Anchorage, Alaska, on June 7, 1999. The cause of death was noted to be drowning. The examination also revealed a fracture of the right hemipelvis iliac crest, sternum, and the sixth right anterior rib.

Toxicological samples were tested at the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma, on July 7, 1999. Phentermine was detected in the pilot's urine, and also in his blood at a concentration level of 0.161 (ug/ml, ug/g).

Interviews by the IIC with the two physicians identified by the pilot's spouse, and front seat passenger, as having treated the pilot, revealed no prescription or treatment requiring use of phentermine. The Physician's Desk Reference indicates that phentermine is a stimulant drug, similar to amphetamines.

The Physicians Desk Reference contains the following contraindications and warnings, in part: "...moderate to severe hypertension, ...agitated states. ...phentermine hydrochloride may impair the ability of the patient to engage in potentially hazardous activities such as operating machinery or driving a motor vehicle; the patient should be cautioned accordingly. Precautions: Caution is to be exercised in prescribing phentermine hydrochloride for patients with even mild hypertension. Adverse Reactions: Central Nervous System: Overstimulation, restlessness, dizziness, insomnia, euphoria, dysphoria, tremor, headache... ."

SURVIVAL ASPECTS

After the accident, the cabin and fuselage appeared undamaged. The Cessna A185F has two doors, one on each side of the cabin, adjacent to the front seats. Postaccident inspection revealed these doors were not distorted, and could be opened and closed normally.

The pilot was wearing an inflatable life jacket. This life jacket was uninflated when removed from the pilot. The three passengers were not wearing personal flotation devices at the time of the accident. Life jackets were on board the airplane, located behind the rear bench seat. After exiting the airplane, the female passenger was given a life jacket by the other passengers, who continued attempts to free the pilot. Once a witness from shore arrived in a

canoe, the two male passengers were provided with life vests.

The female passenger told the IIC that she did not receive any emergency brief prior to the flight. She was not aware that life jackets were on board the airplane until she noticed them while placing her purse behind the rear seat.

All four occupants were provided with headsets, and were able to talk clearly to each other via intercom.

All four occupants were wearing lap belts, which had single strap, diagonal cross-chest torso restraints. The front seat torso restraints incorporated an inertial reel, attached to the airframe ceiling between the seats, and crossed the chest to a buckle located behind the outboard hip of the occupant. The rear seat shoulder straps attached to the aircraft above the outboard shoulder, and crossed to slightly behind the inboard hip of the occupant. The rear seat torso restraints did not include inertial reels.

None of the occupants received impact related injuries. The female passenger told the IIC that after the airplane stopped moving, the passenger in the right-front seat directed everyone to release their seatbelts and get out. She stated she released her belt without difficulty, and fell to her left on top of the other rear seat passenger. She was helped out of the right side door by the other two passengers. None of the passengers described difficulty disconnecting their seatbelt buckles.

The local fire department diver who removed the pilot from the inverted airplane told the IIC he was able to easily release the pilot's lap belt buckle. When he did so, the pilot slid out of the airplane with no restrictions. At the scene, the NTSB IIC was able to operate the pilot's seatbelt buckle smoothly, and without binding, both with the belt assembly loose, and under tension.

The pilot's door included a locking feature whereby if the internal door handle is rotated fully forward, the outside handle will not open the door. If rotated halfway aft (toward "open"), the outside handle is unlocked. If rotated fully aft, the door latch is opened. After the airplane was recovered, the pilot's door was found locked. Once unlocked, the door latch assembly operated easily, and without binding. The IIC sat in the pilot's seat and closed the left door. The left door handle was located aft of the IIC's outboard shoulder. The IIC had to twist his torso to the left, and reach backwards, to reach the door handle.

The IIC, who is shorter and lighter than the pilot, sat in the pilot's seat with the seatbelt buckled. The female end of the buckle, located on the left (outboard) side of the pilot's seat, was aft of, and below, the IIC's left hip. When the left door was closed, the buckle was masked below the door-mounted armrest, between the seat and the door.

The IIC sat in the pilot's seat, and went through the steps required to slide the pilot's seat aft. The steps were: (1) Reach behind the seat with the right hand and manually disengage the

seat track lock. (2) At the same time, reach below the front of the seat with the left hand, and release the seat. (3) Push aft with feet to slide the seat.

FAA Advisory Circular (AC) AC-43-12A, discusses the attachment of single, diagonal type, shoulder harnesses, but does not discuss the lower belt attachment location.

AC-21-34, Shoulder Harness-Safety Belt Installations, Chapter 2 (Installation Geometry) states, in part: "(1) A proper installation geometry for the diagonal shoulder harness positions the shoulder belt so that it passes over the midpoint of the shoulder, with the lower end fastened well to the side of the occupant's hip..." Chapter 3 (Conclusions), includes a "Shoulder Harness-Safety Belt Checklist, which says, in part: "(16) Lower attachment of single diagonal shoulder belt positioned to the side of occupant's hip."

TESTS AND RESEARCH

The buckle assembly was tested by the IIC for opening under load. With 200 pounds suspended directly from the assembly, the buckle opened using one hand and about 10 pounds of force.

Cessna inertial reel seatbelt assembly, part number S2199-19, was ordered from Cessna for comparison to the accident assembly. The assembly received from the manufacturer was identical to that removed from the accident airplane. Additionally, a standard seatbelt assembly, Cessna part number S2275B201, was ordered. The female end of the standard, non-inertial reel assembly was shorter than the female section of the inertial reel assembly.

The airplane had a combination of modifications installed. These modifications were the installation of a Continental IO-550 engine, a Hartzell 3-bladed propeller, EDO 2960 floats, and a Robertson STOL kit. According to an FAA flight test engineer who was consulted regarding the impact of these modifications upon the airplane's stability, none of these modifications, either singly or in combination, would have a destabilizing effect.

ADDITIONAL INFORMATION

The pilot's seat was released to a representative of the pilot's estate on September 28, 1999.

Pilot Information

Certificate:	Private	**Age:**	56,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 30, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2156 hours (Total, all aircraft), 80 hours (Total, this make and model), 2100 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N61609
Model/Series:	A185F A185F	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18504235
Landing Gear Type:	Float	**Seats:**	4
Date/Type of Last Inspection:	May 28, 1999 Annual	**Certified Max Gross Wt.:**	3320 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1960 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550-D3B
Registered Owner:	LAWRENCE A. SMITH	**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:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ODT ,108 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	10:35 Local	**Direction from Accident Site:**	235°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	15°C / -3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CAMPBELL LAKE , AK	**Type of Flight Plan Filed:**	None
Destination:	LONGMARE LAKE , AK	**Type of Clearance:**	None
Departure Time:	10:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	LONGMARE LAKE	**Runway Surface Type:**	Water
Airport Elevation:	200 ft msl	**Runway Surface Condition:**	Water-choppy
Runway Used:	35	**IFR Approach:**	None
Runway Length/Width:	5000 ft / 0 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 3 None	**Latitude, Longitude:**	60.319423,-150.789413(est)

Administrative Information

Investigator In Charge (IIC):	Thomas, Matthew
Additional Participating Persons:	WALTER G ZACKOWITZ (FAA FSDO); ANCHORAGE , AK W. B WELCH (CESSNA); WICHITA , KS
Original Publish Date:	June 21, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46561