Aviation Investigation Final Report

Location:	NEW RIVER, Arizona	**Accident Number:**	LAX96FA114
Date & Time:	February 17, 1996, 17:15 Local	**Registration:**	N2596Z
Aircraft:	Bellanca 8KCAB	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot told the operator that he intended to go to the designated aerobatic practice area. The aircraft's wreckage was found the next morning several miles north of that location. The elevation at the aerobatic practice area was about 1,500 feet msl. Ground elevation at the accident site was estimated to be about 1,700 to 1,800 feet msl. The pilot was practicing in anticipation of continued video taping which was scheduled to resume within the next few days. For this recording session, there were plans to use a ground positioned video camera. In the previous video, a cockpit positioned camera had been used for the recording. In that recording, the pilot had entered the maneuvers between 2,000 and 2,500 feet msl, generally descending between 200 to 400 feet in the course of a maneuver. The aircraft struck the ground in a 30-degree downward angle with forward airspeed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: failure of the pilot to maintain proper altitude/clearance above the terrain, while performing an aerobatic maneuver.

Findings

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

Findings

1. AEROBATICS - INITIATED - PILOT IN COMMAND
2. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On February 17, 1996, about 1715 hours mountain standard time, a Bellanca 8KCAB, N2596Z, collided with flat desert terrain while maneuvering near an aerobatics practice area west of New River, Arizona. The aircraft was destroyed and the pilot received fatal injuries. The aircraft was operated by Glendale Aviation and rented to the pilot for the personal flight. The flight originated in Glendale, Arizona, at 1645 on the day of the accident. Visual meteorological conditions prevailed at the time and no flight plan had been filed.

After renting the aircraft, the pilot obtained an emergency parachute and told the operator that he intended to fly to the designated aerobatics practice area to practice maneuvers. He asked several people in the immediate area if they would like to go on the flight, but no one had the time available. The operator said that he expected the pilot to return in about 1 hour, which had been his custom over the past several months. There were no known eyewitnesses to the accident.

About 0830 on the morning following the accident, the aircraft's wreckage was accidentally found by a hiker. Sheriff's deputies who responded to the scene reported that the accident site was in an uninhabited desert area, which was located about 4.5 miles southwest of the junction of Interstate 17 and New River Road. The site can be located on a chart at 33 degrees 39 minutes north latitude and 112 degrees 11 minutes west longitude. Ground elevation at the accident site was estimated to be about 1,700 to 1,800 feet msl.

PERSONNEL INFORMATION

The pilot's flight instructor reported he flew with the pilot about 12 to 14 hours during a course of aerobatic instruction. He thought he administered the pilot a biannual flight review in the same make and model aircraft. He said he was not sure of the hours and dates since he was not able to refer to his logbook while making a statement.

During the periods in which he gave the pilot aerobatic instruction, he recalled that the pilot always demonstrated a conservative approach to flying. He told Safety Board investigators that he had previously flown with the pilot in the vicinity of the accident site and that he told the pilot about the higher terrain elevation in that area on more than one occasion. He believed that on the day of the accident, the pilot was aware of the higher terrain elevation.

The pilot was in the process of having a video produced which was to illustrate his aerobatics experiences. The first recording session began on February 5, 1996, and was concluded on February 8, 1996. This session was conducted by a cinematographer seated in the rear of the

aircraft. The final phase of recording was scheduled to begin within the next few days using a ground positioned video camera. Safety Board investigators viewed an edited copy of the previous recording.

In the earlier recording, which was conducted over the aerobatics practice area, the camera was positioned to the right side of the pilot's head just above shoulder level. This perspective gave watchers a simultaneous view of the maneuvers and the aircraft instrument panel. In this session the pilot performed a series of rolls, loops, and spins that he generally entered from an altitude of between 2,000 and 2,500 feet msl. The maneuvers were completed with altitude losses ranging from about 200 to 400 feet. The pilot climbed back to the entry altitude before initiating another maneuver. The ground elevation at the aerobatics practice area is about 1,500 feet msl.

AIRCRAFT INFORMATION

According to Federal Air Regulation 23.337, aerobatic aircraft, at a minimum, must accommodate g-loads ranging from +6 to -3 g's. This aircraft was designed to accommodate aerodynamic loads ranging from +6 to -5 g's. The aircraft's instrument panel was equipped with a g-meter which displays and records the highest positive and negative g forces the aircraft experiences. Those values are shown on the face of the instrument until the meter is manually reset.

The operator reported that the aircraft had been refueled with 3 gallons of aviation fuel prior to departure which brought the total fuel onboard to 18 gallons. The fuel selector handle was found positioned on both. Considering a fuel consumption rate of about 10 gph, Safety Board investigators estimated that about 13 gallons were onboard at the time of the accident.

According to the rental agreement, the engine tachometer read 851.88 hours on departure from Glendale airport. It read 852.17 hours when it was found at the accident site.

WRECKAGE AND IMPACT INFORMATION

The aircraft crashed on level dry desert terrain on a heading of 034 degrees. The initial impact site and a freshly cut limb on a 5-foot cactus were identified during an inspection of the site. The angle formed by a line connecting those points and the horizon measured 30 degrees. The wreckage was distributed from the initial impact point along the heading of 034 degrees for a distance of 345 feet. The wreckage path measured 33 feet wide and the main wreckage was found at the opposite end of the wreckage distribution.

There was no evidence of an in-flight breakup as all aerodynamic structures and associated flight control surfaces were found at the accident site. An examination of those flight controls and cables was conducted; however, due to the numerous breaks in the control cables it was not possible to establish control continuity. All breaks in the control cables exhibited a similar splayed appearance. There was no evidence found indicating previous control sticking,

chafing, or binding.

The airframe overall exhibited evidence of crush, collapse, and multiple overload fractures. No major structural component remained intact, including the empennage and all tail surfaces. The propeller was found to have separated from the engine at the propeller flange. It was located about 160 feet beyond the initial impact point in the final direction of flight. One blade was bent and curled aft about midspan and exhibited a series of leading edge gouges. The opposite blade was bent aft near the blade root. The second blade also displayed some torsional twisting and leading edge gouges.

Heavier, compact mechanical components, such as the oil sump, the magnetos, the starter, the generator, and the fuel injector, separated from the engine and airframe. Components such as these were found at various points throughout the forward third of the wreckage distribution area. The engine broke free from its mounting points and was found about 305 feet beyond the impact point. The cylinders remained attached to the engine case, but their top and bottom cooling fins exhibited evidence of crush and deformation.

The engine was reexamined after being recovered from the accident site. The No. 1 cylinder intake and exhaust push rod tubes were bent. The fuel line to the No. 1 cylinder was separated and the No. 3 cylinder intake push rod tube was bent. The intake and exhaust manifolds for all four cylinders separated from the engine.

The rocker box covers were removed and the crankshaft was moved slightly by hand, confirming valve train continuity in all four cylinders. Continuity through the accessory gear section was also established.

Both magnetos were hand rotated and both produced sparks at all four posts.

The pilot's seat was equipped with a 5-point restraint system and the pilot wore an emergency parachute. The restrain system was found separated from the airframe, exhibiting numerous rips and tears. Its latching mechanism was found outside the aircraft, separated from the lap and shoulder belts, as well as the crotch strap. The parachute had not been deployed, the safeties on the quick release cabin door were in place and the door had not been jettisoned.

The emergency locator transmitter (ELT) arming switch was destroyed and the coaxial antenna cable separated between the unit and its external antenna. No ELT signals were reported in the vicinity of New River from the estimated time of the accident until the accident site was located about 0830 the following morning.

MEDICAL AND PATHOLOGICAL INFORMATION

On February 19, 1996, an autopsy was performed by the Maricopa County Office of the Medical Examiner. The autopsy results revealed evidence of pre-existing atherosclerotic cardiovascular disease. The attending pathologist reported the left anterior descending

coronary exhibited a 50 percent occlusion while the left circumflex coronary artery was found to be 30 percent occluded.

Toxicological samples were collected and sent to the Civil Aero Medical Institute (CAMI) for further analysis. Upon their arrival the samples were screened for carbon monoxide, cyanide, volitiles, and drugs. The manager of the CAMI toxicology and accident research laboratory reported negative findings for all substances screened except for Salicylate (an analgesic). The toxicological report is appended to this report.

ADDITIONAL INFORMATION

The aircraft wreckage was recovered by Air Transport and transported to their storage facility in Phoenix, Arizona. The wreckage was released to a representative of the registered owners on October 10, 1996. A copy of the release is appended to this report.

Pilot Information

Certificate:	Commercial	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
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 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 16, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	400 hours (Total, all aircraft), 30 hours (Total, this make and model), 400 hours (Pilot In Command, all aircraft), 9 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bellanca	**Registration:**	N2596Z
Model/Series:	8KCAB 8KCAB	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	351-77
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	April 1, 1995 Annual	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:	55 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	852 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	AEIO-360-H1A
Registered Owner:	MARK WINTON, ET. AL.	**Rated Power:**	180 Horsepower
Operator:	JAKE STARR	**Operating Certificate(s) Held:**	None
Operator Does Business As:	GLENDALE AVIATION	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DVT ,1476 ft msl	**Distance from Accident Site:**	14 Nautical Miles
Observation Time:	16:45 Local	**Direction from Accident Site:**	340°
Lowest Cloud Condition:	Unknown	**Visibility**	5 miles
Lowest Ceiling:	Broken / 18000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	26°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	GLENDALE , AZ (GEU)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	16:45 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

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:**	33.680976,-112.089424(est)

Administrative Information

Investigator In Charge (IIC):	Crispin, Robert
Additional Participating Persons:	CHARLES L PRINCE; SCOTTSDALE , AZ GERALD R JAMES; DALLAS , TX
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29260