# Aviation Investigation Final Report

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| **Location:** | FORT LAUDERDALE, Florida | **Accident Number:** | MIA97FA047 |
| **Date & Time:** | December 26, 1996, 09:30 Local | **Registration:** | N7596F |
| **Aircraft:** | Champion 7GCBC | **Aircraft Damage:** | Substantial |
| **Defining Event:** | | **Injuries:** | 2 Fatal |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot initiated a loop from an altitude of about 50 feet above ground level then failed to recover before impact with water. The left wing aft hinge attach hardware was not in place. No determination could be made as to when the hardware separated. The airplane was last inspected in accordance with an annual inspection 2.01 hours earlier and the airplane had been flown on three separate flights excluding the accident flight since the annual inspection was performed. None of the flights involved acrobatic maneuvers. The hardware is required to be inspected for condition and security during an annual inspection. Tension overload failure of the left aileron up cable was noted near the wing root area. Weight and balance calculations indicated that the airplane was over gross weight at the time of takeoff and at the accident. FAR'S indicate that aerobatic maneuvers are to be performed so completion occurs at an altitude at least 1,500 feet above ground level. The engine was started and found to operate normally.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Intentional aerobatics at too low an altitude that did not allow for recovery from an intentional maneuver. Contributing to the accident was the operation of the airplane at an overgross weight condition.

## Findings

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

Findings
1. (F) AEROBATICS - PERFORMED - PILOT IN COMMAND
2. TERRAIN CONDITION - WATER
3. (C) ALTITUDE - INADEQUATE - PILOT IN COMMAND
4. WING,WING ATTACHMENT BOLT - UNDETERMINED
5. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - PILOT IN COMMAND

## Factual Information

HISTORY OF FLIGHT

On December 26, 1996, about 0930 eastern standard time, a Champion Aircraft Corporation 7GCBC, N7596F, registered to Benson & Kobe Aviation, Inc., crashed into the Everglades Wildlife Management Conservation Area 3A, near Fort Lauderdale, Florida. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 CFR Part 91 personal flight. The commercial-rated pilot and one passenger were fatally injured. The flight originated about 0909 from the North Perry Airport, Hollywood, Florida.

Witnesses observed the airplane circle an area known as the Everglades Holiday Park about 50-100 feet above ground level and while flying westbound, roll to the right. They momentarily lost sight of the airplane then observed it to climb nearly vertical and near the apex, roll to the right. The airplane then began descending nearly vertical and obstructions shielded their view. There was no report of an engine failure or malfunction during the ascent. Another witness observed the airplane pitch nearly vertical and at the apex about 200-300 feet above ground level, the airplane continued onto its back "like a loop." The airplane then started descending nearly vertical and he then lost sight of the airplane due to obstructions. He did not witness the accident but heard the crash.

PERSONNEL INFORMATION

Information pertaining to the pilot-in-command is contained on page 3 of the Factual Report-Aviation. Review of his pilot logbook revealed that he had received aerobatic instruction on four flights lasting a total of 4.2 hours in June of 1977. His logbook documents 14 separate flights lasting 13.2 hours between July 5, 1977, and April 15, 1979, in which aerobatic maneuvers are listed. A break in flying was noted between April 15, 1979, to June 15, 1990, when he documented flying again to August 25, 1990. Another break in flying was noted between August 25, 1990, and April 13, 1992. Still another break in flying was noted between April 13, 1992, to March 23, 1996, when he received a Biennial Flight Review (BFR) in the accident airplane. The entry for the BFR indicated that the accident pilot performed steep turns, slow flight, stalls, spins, and touch-and-go landings. The accident pilot flew the accident airplane a total of 5.3 hours on five other flights after the BFR flight between March 31 and November 29, 1996. A passenger on the November 29th flight reported that the pilot did not perform any aerobatic maneuvers.

AIRCRAFT INFORMATION

Information pertaining to the airplane is found on page 2 of the Factual Report-Aviation and Supplements A and B. Review of the aircraft records revealed that the airplane was signed off

as last being inspected in accordance with an annual inspection on November 21, 1996. The FAA certificated mechanic with inspection authorization stated that when he inspected the airplane he did not use a checklist but relied upon his memory. One of the owners and another person removed the inspection access panels but only he performed the inspection. Minor discrepancies were noted, fixed immediately, and a list of discrepancies was reportedly provided to the owners. He recalls that both wing root fairings were removed and all wing spar attach hardware for both wings was installed when he inspected the airplane. He stated that the inspection took about 8 hours over the course of several days. The airplane had been operated for 2.01 hours on three separate flights since the annual inspection at the time of the accident; none of the flights involve aerobatic maneuvers. According to the airplane service manual, the wing hinge bolts are to be checked for condition and security every 100, 500, and 1,000 hours. The service manual also indicates that "Both the annual and the 100 hour inspections are complete inspections of the aircraft, identical in scope." One of the co-owners of the airplane stated that the wings have not been removed since the airplane was purchased. The airplane was registered to the current owners on May 20, 1992. Further review of the aircraft logbooks revealed that the airplane was last recovered on February 15, 1988.

## METEOROLOGICAL INFORMATION

Information pertaining to the weather is contained on pages 3 and 4 of the NTSB Factual Report-Aviation.

## WRECKAGE AND IMPACT INFORMATION

The crash site was located in conservation area 3A of the Everglades Wildlife Management area. The airplane was observed to be upright on a magnetic heading of about 205 degrees partially submerged in about 5 feet of water with all components necessary to sustain flight attached or partially attached to the airframe.

The empennage aft of the wings was observed to be displaced to the right. The inboard aft portion of the left wing was not submerged and was observed to be partially resting on top of the fuselage. The left wing aft spar hinge bolt, castellated nut, cotter key, nor washers were not in place nor located. The left wing aft spar fitting on the fuselage was examined and the bolt holes were observed to be elongated toward the outboard side. The left wing aft spar fitting of the wing was examined and the bolt holes were also determined to be elongated. The left wing inboard rib exhibited slight deformation and the structure adjacent to the aft fitting on the left fuselage was not observed to be damaged. The tubing to the left wing aft fitting at the fuel tank was separated from the "B-Nut," and the left aileron up cable was observed to be failed about 6 inches outboard of the pulley located near the wing root area. Examination of the cable revealed evidence of tension overload failure. The cable was displaced to the right 180 degrees away from the normal direction of travel. Impact damage from the cable was noted against a cotter key and fuselage structure. Examination of the left aileron sector near the control surface revealed evidence of impact damage with the up side of the sector against the stop. The left and right ailerons up and down cables were connected to each bellcrank

near each control surface and the left and right aileron cables were connected to each aileron sector near the aft seat control stick. The arm at the aft seat stick which attached to is the left and right aileron up cables was failed with signatures consistent with overload failure. The left wing forward spar hinge bolt and associated hardware was in place and impact damage to the left wing leading edge near the wing root was noted. The lift struts for the left wing were attached at the fuselage and at the wing fittings and the left main landing gear was observed to be displaced aft. The left flap was separated from the torque tube and fully extended while the right flap was observed to be fully retracted. The left flap push-pull rod was examined and determined to be bent toward the fuselage. Rudder and elevator control cable continuity was confirmed. The right wing fuel tank was observed to be about 1/2 full; no fuel sample was taken. The right wing forward and aft spar hinge bolts, nuts, washers, and cotter keys were observed to be in place and secured and the lift strut attach bolt at fuselage was observed to be failed in shear. The right main landing gear separated from the fuselage. The engine which was completely submerged was still attached to the engine mount and was displaced to the left. The fuel selector was found in the "off" position and no fuel was found in the fuel lines to the fuel selector or in the fuel line from the outlet of the fuel selector to the gascolator. The gascolator bowl was observed to be separated and was not located. Both seats are non-adjustable.

The engine was removed from the airframe and placed in a test stand. Before an attempt to start the engine the carburetor bowl was drained and found to contain water; no fuel was found. The engine was then started and operated to full rated rpm.

## MEDICAL AND PATHOLOGICAL

Postmortem examinations of the pilot and passenger were performed by John Thogmartin, M.D., Associate Medical Examiner. The cause of death for the pilot who was seated in the front seat was listed as multiple blunt force injuries. The cause of death for the rear seated passenger was listed as drowning with blunt cranial cerebral trauma as a significant contributory factor.

Toxicological analysis only on specimens of the pilot was performed by the FAA Toxicological and Accident Research Laboratory. The results were negative for carbon monoxide, cyanide, volatiles, and tested drugs. Toxicological analysis was also performed by the Office of the Broward Medical Examiner. The results were negative for the drug screen. The results were positive for carbon monoxide (less than 5 percent) and ethanol (.01 g percent).

## ADDITIONAL INFORMATION

According to the one of the co-owners of the airplane, the accident pilot called him on December 25, 1996, between 1700 and 1900 hours and asked if the airplane was available for a flight the following morning. The pilot advised him that he wanted to take two people flying and he did not ask for parachutes.

Review of the airplane parts manual revealed that the left wing aft hinge is secured by one each AN4-13 bolt, two each AN960-416 washers, one each AN310-4 nut, and one each AN380-2-2 cotter key.

Weight and balance calculations were performed using the airplane licensed empty weight with oil (1,182 pounds), the weight of the pilot based on a February 1996, medical (255 pounds), information provided by one of the co-owners of the airplane pertaining to fuel on board at the time of takeoff (126 pounds), and the weight of the passenger based on a statement from his mother (172 pounds). The airplane weight at the time of takeoff was calculated to be 1,729.4 pounds including fuel used to start the engine taxi, and perform an engine run-up. The airplane weight at the time of the accident was calculated to be 1,711.4 pounds including 18 pounds of fuel consumed during the 21-minute flight. According to the pilot's operating manual the gross weight of the airplane is 1,650 pounds.

According to the Federal Aviation Regulations (FARs) 14 CFR Part 91.303, in part, no person may operate an aircraft in aerobatic flight below an altitude of 1,500 feet above the surface. Also, 14 CFR Part 91.307 indicates also in part that unless each occupant of the aircraft is wearing an approved parachute, no pilot of a civil aircraft carrying any person (other than a crewmember) may execute any intentional maneuver that exceeds a nose-up or nose-down attitude of 30 degrees relative to the horizon. No parachutes were noted during recovery of the occupants and both were noted to be wearing lapbelts.

According to FAA records, the pilot did not have a waiver to perform low altitude aerobatics.

The information pertaining to the missing hardware for the left wing aft hinge was provided in person to Detective Robert O'Neil of the Broward County Sheriff's Office while viewing the suspect area on December 27, 1996, about 1730 hours eastern standard time.

The wreckage minus the retained components was released to Mr. Jamie McArthur of Crittenden Adjustment Company (Aviation) Inc., on February 6, 1997. The retained components were also released to Mr. Jamie McArthur on July 14, 1997.

## Pilot Information

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| **Certificate:** | Commercial | **Age:** | 46,Male |
| **Airplane Rating(s):** | Single-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:** | February 26, 1996 |
| **Occupational Pilot:** | UNK | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 314 hours (Total, all aircraft), 7 hours (Total, this make and model), 267 hours (Pilot In Command, all aircraft), 2 hours (Last 90 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Champion | **Registration:** | N7596F |
| **Model/Series:** | 7GCBC 7GCBC | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal; Utility | **Serial Number:** | 239-70 |
| **Landing Gear Type:** | Tailwheel | **Seats:** | 2 |
| **Date/Type of Last Inspection:** | November 21, 1996 Annual | **Certified Max Gross Wt.:** | 1650 lbs |
| **Time Since Last Inspection:** | 2 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 2010 Hrs | **Engine Manufacturer:** | Lycoming |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | O-320-A2B |
| **Registered Owner:** | BENSON & KOBE AVIATION, INC. | **Rated Power:** | 150 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | None |
| **Operator Does Business As:** | | **Operator Designator Code:** | |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | HWO ,9 ft msl | **Distance from Accident Site:** | 14 Nautical Miles |
| **Observation Time:** | 09:50 Local | **Direction from Accident Site:** | 106° |
| **Lowest Cloud Condition:** | Scattered / 2500 ft AGL | **Visibility** | 15 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 10 knots / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | 140° | **Turbulence Severity Forecast/Actual:** | / |
| **Altimeter Setting:** | 30 inches Hg | **Temperature/Dew Point:** | |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | HOLLYWOOD , FL (HWO ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | | **Type of Clearance:** | None |
| **Departure Time:** | 09:09 Local | **Type of Airspace:** | Class G |

## Airport Information

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| **Airport:** | NORTH PERRY HWO | **Runway Surface Type:** | |
| **Airport Elevation:** | | **Runway Surface Condition:** | |
| **Runway Used:** | 0 | **IFR Approach:** | |
| **Runway Length/Width:** | | **VFR Approach/Landing:** | |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 Fatal | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 1 Fatal | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 Fatal | **Latitude, Longitude:** | 26.14953,-80.269332(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Monville, Timothy |
| **Additional Participating Persons:** | ERNEST J DAVIS; FORT LAUDERDALE, FL<br>EDWARD G ROGALSKI; BELLEVIEW , FL<br>ROBERT O'NEIL; FT LAUDERDALE , FL |
| **Original Publish Date:** | March 31, 1998 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=38130 |