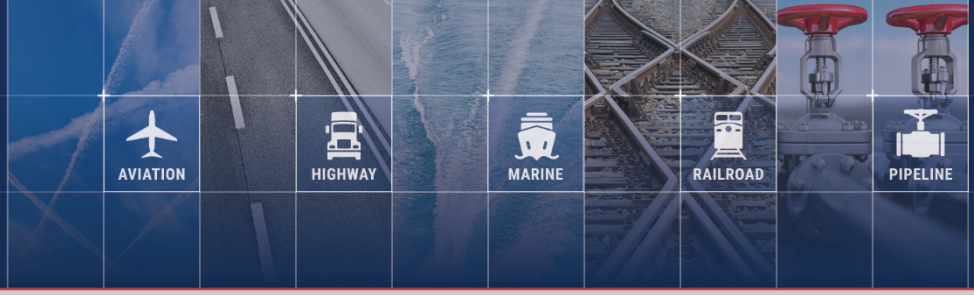

Aviation Investigation Factual Report

Location:	CRESWELL, Oregon	**Accident Number:**	SEA97FA049
Date & Time:	January 19, 1997, 12:40 Local	**Registration:**	N9677S
Aircraft:	Champion 7-GCBC	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Factual Information

HISTORY OF FLIGHT

On January 19, 1997, approximately 1240 Pacific standard time a Champion 7-GCBC, N9677S, operated by Cottage Grove Aviation, and being flown by a private pilot, was destroyed during an in flight collision with terrain following a loss of control in flight while maneuvering near Creswell, Oregon. The pilot-in-command and passenger were both fatally injured. Visual meteorological conditions existed and no flight plan had been filed. The flight, which was personal in nature, was to have been operated under 14CFR91, and originated from the Cottage Grove airport, Cottage Grove, Oregon, shortly after noon.

Several adults heard or witnessed the accident. One ear-witness described hearing a "loud pop followed by 5 seconds of fluttering and (the) thud." He characterized the sound as "just like an old paper kite that you broke in a strong wind with the loud pop of the wood followed by the flutter of the paper (or canvas) as it dove to the ground" (refer to statement of Paul Spicer).

One eye-witness reported hearing the aircraft's engine "winding up" followed by silence. This event was repeated several times after which the witness acquired visual contact with the aircraft. He reported that when he saw the aircraft it was "pointed straight down towards the ground and was spinning relatively slow(ly) as it came down." He further stated that he "could hear a noise like a 'flag flapping in a very stiff wind'" and that it appeared that the "end of one of the wings was missing and some of the sheet metal had torn loose and was causing the 'flapping' sound" (refer to statement of Joseph Johnston).

Another eye-witness reported observing the aircraft performing multiple "half loops and spins" and that it then flew away for several minutes returning from the west. When he heard it again he observed that "the plane was heading straight down spinning clockwise again. The plane was close to the elevation where it pulled out the first time. (That's) when I saw a piece of the plane come off" and that a few seconds later "I heard a faint sound of a crunch" (refer to statement of Brad Elliott).

Additionally, two young boys (ages 12 and 13) witnessed the aircraft maneuvering in the area, and the subsequent accident. They were interviewed by the investigator in charge (refer to ATTACHMENT I-1). They reported observing the aircraft entering spin maneuvers (five or six separate spin events) but that no other acrobatic type maneuvers were observed. They also reported that during the last maneuver, either during the end of the spin or the beginning of the pullout something broke off the right wing.

PERSONNEL INFORMATION

According to documentation recovered at the accident site and also acquired from the Federal Aviation Administration (FAA), the pilot had been issued a private pilot certificate on April 12, 1994, with an airplane single engine land rating. His most recent FAA medical was conducted on March 15, 1996. He was issued a second class medical certificate with no limitations at that time.

The pilot's most recent logbook was opened on April 23, 1994, with 90.7 hours of total (all single engine) flight time brought forward. The last entry within the logbook was dated January 15, 1997, and at that time the pilot's total (all single engine) flight time was 290.8 hours, and his total pilot-in-command time was 225.0 hours.

His total experience in the model 7-GCBC aircraft (all in N9677S) was reconstructed from this most recent logbook and paperwork recovered from the accident site, the operator and witnesses. The following is a reconstruction of that time:

FLT# DATE TT PIC REMARKS #1 01/14/97 0.6 0.6 "Citabria checkout complete (signed #CFI 447727660)" Logbook entry.*

#2 01/14/97 0.4 0.4 "Spins fully developed right & left, rolls, steep banked turns, three point." Logbook entry. Refer to statement of Anne Walton

#3 01/15/97 0.7 0.7 "Rolls, spins, steep banked turns, wing-overs, three point & wheel landings." Logbook entry. Refer to statements of Joshua Bloom & Stanley Houck.

#4 01/19/97 0.8 0.8 Refer to statement of Katherine Walton.

#5 01/19/97 0.7 0.7 Accident flight

*Under the "Additional Endorsements" section of the pilot's logbook an entry dated 01/14/97 read as follows: "I have given Mr. Jeremy Castle flight training in spin entry, spins, and spin recovery techniques and he has demonstrated competency in those maneuvers. (signed #CFI 447727660)"

The only reference to "spins" noted in this flight log (aside from those referenced above) were those entered on 04/07/94 during a 0.6 hour dual flight in a Pitts S-2B. The remarks section of the log contained the following entry: "Loops, rolls, stalls, spins, inverted spins, flat spins, point rolls, familiarization to type (signed) #1703175." No other references to spins or acrobatic maneuvers were noted.

The manager of the fixed based operation (FBO) at Cottage Grove airport where the aircraft was based, reported to the investigator in charge that both he and the pilot's check pilot (refer

to flight #1 above) had told the pilot that he was not to conduct any acrobatic maneuvers while flying the aircraft.

AIRCRAFT INFORMATION

N9677S, a Champion "Citabria" 7-GCBC, serial number 28, was, according to FAA records, manufactured in early 1966. The aircraft was privately owned and leased to Cottage Grove Aviation, the local FBO at the Cottage Grove airport. The only aircraft log made available to the NTSB was annotated "Log #2" on its first page. This log was opened with an initial entry of 02/02/93 showing a tach time of 1,439.0 hours, TTSN of 1,691.0 hours and a "100 hr inspection completed this date IAW FAR 43." The last inspection documented within the log was on 10/17/96 at a tach time of 1754.4 hours (TTSN 1,989.1 hours) and was recorded as a 100 hour inspection. The next, and last entry within the log, was dated on the same date and 0.4 hours later, and documented the installation of an overhauled propeller. The aircraft's approximate total time of 2,039 hours was derived from paperwork at the accident site showing the aircraft dispatched at the beginning of flight #4 (01/19/97 from above) with a total of 1,804.7 hours of tach time (50.3 additional hours of tach time since the TTSN of 1989.1).

A search of NTSB accident records revealed that a 7-GCBC, N9677S, was involved in an accident on June 13, 1977, at Hanagita Lake, Alaska, whereby the aircraft incurred substantial damage. The aviation brief reported that the accident occurred during taxi to takeoff when the aircraft nosed over. A search of FAA records on the aircraft in Oklahoma City revealed no reference to the accident. However, an FAA Form 337 "Major Repair and Alteration" dated 02/12/74 contained the following entry "Recovered fuselage and flaps with Stitts Poly Fiber #101, S.T.C. SA-108 WE, as per Stitts instruction manual (signed A&P #1505004." A similar S.T.C. dated 02/02/93 was maintained with the aircraft's current logbook (refer to ATTACHMENT M-I).

As aircraft logbooks previous to February of 1993 were not available, it could not be determined if any previous damage or corrective maintenance had been incurred to the right wing prior to the time of the accident (refer to ATTACHMENT FAA-I).

METEOROLOGICAL INFORMATION

The aviation surface weather observation taken at 1256 hours at the Mahlon-Sweet airport, Eugene, Oregon, on the afternoon of the accident reported winds of 110 degrees magnetic at 7 knots and a visibility of 10 miles in light rain showers. The ceiling was measured as 6,000 foot overcast and the temperature and dew point were recorded as 52 and 46 degrees Fahrenheit respectively. During the period 4 hours before and after the accident, the surface winds at the Eugene airport ranged from calm to 8 knots with directions generally southeasterly. No gusts were reported.

WRECKAGE AND IMPACT INFORMATION

The aircraft crashed in an open, agricultural field of six inch high grass. The terrain was flat and the ground was soft, wet and muddy around the ground impact site. The initial ground impact site and final resting place were observed to be co-incident, and there were no ground scar impressions other than those where the aircraft lay. The ground impact site was located at 43 degrees 56.5 minutes north and 122 degrees 57.7 minutes west latitude and longitude respectively, and at an elevation of approximately 525 feet MSL (refer to CHART I). The crash site was nine nautical miles due north (magnetic) of the Cottage Grove airport (two nautical miles east of the Creswell airport).

The aircraft was observed at the ground impact site with its longitudinal axis oriented along a 098/278 degree magnetic bearing (nose east). The attitude of the empennage was noted to be approximately 25 degrees nose down and 15 degrees right wing down and the forward portion of the aircraft (engine and forward cockpit) had penetrated approximately 36 inches into the terrain. One propeller blade tip was exposed several inches above ground level. The left wing was observed to be swept somewhat forward of its normal position and twisted approximately 180 degrees counter clockwise such that the outboard leading edge was facing aft. The horizontal and vertical stabilizers and their associated control surfaces and trim tabs were observed to have remained attached and were relatively undamaged (refer to photographs 1 through 5).

The left wing was observed to be continuous from tip to root and remained attached to the fuselage. Both the flap and aileron remained attached, however, the position of the flap could not be determined. The forward and aft struts were observed to have remained attached to both the wing and fuselage attach points. The fabric covering the wing, although crumpled and ripped in places, was observed to be complete from root to tip (refer to photograph 6).

The right wing was observed to be continuous from the root outboard to a point several feet short of the wingtip. The root section of the wing remained attached to the fuselage. Both the flap and aileron remained attached, however, the position of the flap could not be determined. The aileron was buckled and deformed at its mid-span section in an aftward direction, and in line with the strut attach points along the chord-line (refer to DIAGRAM I and photograph 7).

The forward and aft struts were observed to have remained attached to the fuselage attach points. Much of the wing fabric covering the upper surface of the wing was torn off. The forward and aft wood spar beams were exposed within the wing. The aft spar was observed to display multiple fore and aft bending type breaks between the wing root and strut attach points, whereas the forward spar was observed to display extensive up and down splintering along the spar's lateral axis (refer to photographs 8 and 9) especially outboard of the strut attach point.

Both the complete forward and aft right wing spar, excluding only small splinters of wood were located at the aircraft's ground impact site, although the spars were broken as previously described (refer to panoramic photograph 10).

A distinct impact impression in the mud was observed slightly forward of the leading edge of the right wing and in line with the outboard section of the forward wing spar stiffener plates. Numerous small fragments of white paint chips, similar to the white paint found on the metal leading edge of the wing were noted along the impression edge towards the fuselage (refer to photograph 11). The impression ended abruptly as did the paint chips. A section of forward wing spar including a piece of the bottom outboard stiffener plates (fore and aft) was observed within the water filled crater. The inboard section matched the remainder of the stiffener plate area for the forward right wing spar. The piece was separated from the forward wing spar outboard of where the strut attaches to the spar (refer to photograph 11). A closer inspection of this separated piece of spar and stiffener plates displayed a "wing up" bending deformation pattern and extensive longitudinal (spar) splintering of the wood fiber structure outboard of the stiffener plates. The longitudinal splinter matched the consistency of that observed at the inboard section of the remaining outboard forward right wing spar section (arrow 2 from photograph 10). The right wing tip cap was not at the primary ground impact site.

The outboard right wing tip cap and some attached wing fabric was located lying in the same field bearing 204 degrees magnetic and 360 feet distant from the primary ground impact site (refer to photograph 13). This was the largest fragment from the aircraft not found at the primary impact site. Additionally, small slivers of wood, pieces of fabric wing skin and small sections of aluminum stringer material were found in the same general area (refer to page 3 of Supplement I - WRECKAGE DISTRIBUTION DIAGRAM). The smaller fragments were recovered in a ground sweep of the area and placed at the primary ground impact site where the right wing was reassembled (refer to photograph 14).

The airframe, exclusive of the engine was extracted from the impact crater. Post crash examination revealed no evidence of any pre-impact control discontinuity. The engine was extracted from the impact crater. One propeller blade was observed to be folded back around the engine while the opposing propeller blade was bent aft in a shallow arc. Cockpit and instrument documentation could not be accomplished due to the extreme damage in this area.

MEDICAL AND PATHOLOGICAL INFORMATION

Post mortem examination of both the pilot and passenger was conducted by L. Samuel Vickers, M.D., Lane County Medical Examiner, January 21, 1997, at the facilities of Sacred Heart Medical Center, Eugene, Oregon. Neither the pilot nor the passenger were wearing a parachute at the time of the accident.

Toxicological evaluation of samples from the pilot was conducted by the FAA's Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma. All test results were negative (refer to attached report).

TESTS AND RESEARCH

The thickness of the right wing forward and aft spar was measured at several different locations using a micrometer. The maximum and minimum thickness limitations according to the manufacturer were reported as: max = 49/64 inches = 0.765625 inches min = 47/64 inches = 0.734375 inches

The thickness of both the forward (0.757 inch) and aft (0.749 inch) spar from the right wing was measured utilizing a micrometer. The thickness was found to lie within the maximum/minimum tolerances specified above by the manufacturer. The thickness of both the forward (0.798 inch) and aft (0.798 inch) spar from the left wing was found to exceed slightly the maximum/minimum tolerances specified above by the manufacturer. Additionally, the stiffener plates at the forward and aft sides of all four spars (where the forward and aft wing struts attach) were observed to be 90 degrees to the spar surface, that is, the edges of the stiffener plates were not beveled. Beads of black glue were observed along the seams of the stiffener to spar joints for both the forward and aft right wing spars. No such glue beads were observed on the left wing spars.

ADDITIONAL INFORMATION

On-site examination of the wreckage was conducted on January 20, 1997, and the wreckage was subsequently released to H.L.M. AIR SERVICES, INC., for the purpose of recovery. Wreckage release was formally issued on January 29, 1997 (refer to attached NTSB Form 6120.15).

Pilot Information

Certificate:	Private	**Age:**	25,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	March 15, 1996
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	291 hours (Total, all aircraft), 3 hours (Total, this make and model), 226 hours (Pilot In Command, all aircraft), 34 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Champion	**Registration:**	N9677S
Model/Series:	7-GCBC 7-GCBC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic; Utility	**Serial Number:**	28
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	October 17, 1996 Annual	**Certified Max Gross Wt.:**	1650 lbs
Time Since Last Inspection:	50 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2039 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-A2B
Registered Owner:	JERRY D. MARSHALL	**Rated Power:**	150 Horsepower
Operator:	COTTAGE GROVE AVIATION	**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:	EUG ,365 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	12:56 Local	**Direction from Accident Site:**	296°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 6000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	11°C / 8°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	COTTAGE GROVE (61S)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:00 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:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	43.899154,-123.020278(est)

Administrative Information

Investigator In Charge (IIC):	Mccreary, Steven
Additional Participating Persons:	STEVEN ALBERT; HILLSBORO , OR
Report Date:	February 27, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42493

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.