Aviation Investigation Final Report

Location:	MINDEN, Nevada	**Accident Number:**	LAX97FA156
Date & Time:	April 11, 1997, 00:00 Local	**Registration:**	N70644
Aircraft:	Glaser-Dirks DG-300	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had 30 hrs of total glider experience & was on his 1st flight in a Glaser-Dirks DG-300 (a European, single place, production glider). He had been inactive in gliders for a year & had received 5 hrs of recurrency training in Grob 102 & 103 gliders during the previous 5 days. His logbook contained an entry for the previous day's solo flight in a Grob 102, which stated 'steep turns and stalls.' Subsequently, the glider crashed on rolling terrain in a nose-low attitude without appreciable forward motion. During impact, the nose was crushed & the fuselage failed about 3 ft aft of the cockpit. The aft fuselage & empennage were found lying inverted over the left wing. The canopy jettison control was found to have been pulled (released), & there were impact marks on the horizontal stabilizer leading edge at locations consistent with the canopy frame dimensions. Plexiglas from the canopy was found up to 300 yds away. The pilot was found seated upright in the cockpit with his parachute on & his seat belt restraint system fastened. Despite severe lacerations due to ground impact, there was no blood apparent anywhere on the pilot's face. However, a large contusion (bruise) was found across the pilot's forehead, apparently sustained before ground impact, which was consistent with impact with the jettisoned canopy.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: loss of aircraft control for undetermined reason(s), inadequate design of the canopy jettison system, and incapacitation of the pilot, when he was struck by the canopy frame during a jettison sequence.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. LACK OF TOTAL EXPERIENCE IN KIND OF AIRCRAFT - PILOT IN COMMAND
3. STALL/SPIN - ENCOUNTERED - PILOT IN COMMAND

Occurrence #2: MISCELLANEOUS/OTHER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. BAIL-OUT/EMERGENCY EJECTION - ATTEMPTED - PILOT IN COMMAND
5. (C) WINDOW,CANOPY - OTHER
6. (C) ACFT/EQUIP,INADEQUATE DESIGN - MANUFACTURER
7. (C) INCAPACITATION - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On April 11, 1997, exact time unknown, an experimental Glaser-Dirks DG-300 glider, N70644, impacted terrain 8 miles east of the Douglas County Airport, Minden, Nevada. The private pilot was fatally injured and the aircraft was destroyed. Visual meteorological conditions prevailed for the local area personal flight which was towed aloft from the Douglas County Airport at 1210 hours mountain daylight time.

The aircraft was towed aloft to 8,000 feet msl (2,800 feet agl) and released. This was the last contact with the aircraft. When the aircraft did not return at the scheduled time, the operator notified the Federal Aviation Administration (FAA) and an alert notice was issued. The wreckage was located about 1100 the next morning.

PERSONNEL INFORMATION

The 54-year-old private pilot added a glider rating to his certificate on April 14, 1996, and logged 30 hours of total glider time. He also had about 145 additional hours in single engine powered aircraft, with about 46 of those hours accumulated in the prior year. According to the operator, after issuance of his glider rating, the pilot returned home to Illinois and had flown very little glider time in the ensuing year prior to returning to the operator's school in April 1997.

According to the pilots logbook, on April 6, 1997 he flew three dual flights in a Grob 103 glider. On April 7, 1997, he flew two dual flights in the Grob 103. On April 8, 1997, he flew three solo flights in a Grob 102, and on April 10 he flew one solo flight in the Grob 102. All the flights totaled about 5 hours, and the April 10th entry was annotated "steep turns and stalls."

The accident flight was his first flight in the single place DG-300. The operator who rented the pilot the aircraft, told the Safety Board that he considered the pilot qualified for the DG-300 because of his recent instruction and experience in comparable gliders. He added the before the flight the pilot was given a verbal, in cockpit, briefing about the aircraft, and he said that the pilot handled the aircraft well during his tow aloft. According to the operator, who operates a soaring school, the weather was clear and "excellent for soaring." The pilot's performance during the tow aloft was "beautiful." The pilot was wearing a parachute, and according to his son, had started skydiving instruction about the time he learned to fly gliders. His son thought that he had made "at least 20 jumps."

According to the operator, the pilot would normally have performed a one turn spin and recovery during his training the prior year. Entries in the pilot's logbook were not all legible.

Among the legible entries, there was no entry for spins having been demonstrated.

AIRCRAFT INFORMATION

The aircraft is manufactured in Germany by DG Flugzeugbau Gmbh and is type certificated under JAR 22 in Utility category in that country. The aircraft has not been type certificated in the United States where the aircraft are operated in Experimental category. The aircraft has a jettisonable canopy and, according to the manufacturer, they are aware of only one canopy jettison, this in a DG-600 which has a similar canopy. The jettison in that case was successful. Canopy jettison was not demonstrated during the DG-300 flight test program.

According to the operator, the glider had remained assembled for 2 weeks before the accident and had made several other flights in that time. There was no water ballast aboard on the accident flight.

The two previous renters of the aircraft, who flew it on April 6th and 10th, reported no problems or mechanical discrepancies with the aircraft. One commented about the "strange feeling" that was created by the long canopy and the resulting lack of aircraft attitude reference to the horizon..

The aircraft was equipped with a "GPS Secure Flight Recorder" intended for use to substantiate altitudes and distances flown. The damaged unit was sent to the manufacturer, however, there was no data stored.

WRECKAGE AND IMPACT INFORMATION

An airworthiness inspector from the FAA Reno, Nevada, Flight Standards District Office traveled to the accident site. According to the inspector's report, the aircraft impacted terrain on a southerly heading in an area of rolling hills covered with large bushes, typically 8 feet in height. There were areas of nearly flat terrain nearby and the site was near the maximum terrain elevation in the area. The accident site is 8 miles east of the departure airport. The latitude and longitude are 39 degrees 00.39 minutes north, and 119 degrees 36.33 minutes west, respectively (GPS). The elevation at the accident site is 5,940 feet.

According to the same FAA inspector, all the aircraft structure was present at the accident site and there were no ground scars or damage to adjacent vegetation indicative of horizontal motion at impact. Pieces of the canopy Plexiglas were found up to 300 yards east and northeast of the remainder of the wreckage. The nose of the aircraft was destroyed aft to the mid-cockpit location. The left and right wings remained attached to the fuselage; however, each wing was broken about the midspan point in a "V" form with the trailing edge broken open but the leading edge pushed together. The leading edges of the wings exhibited a pattern of 45-degree chevrons and the composite laminations were separated. The leading edge of the left wing was crushed near the left tip and there was an adjacent tree stump which approximately matched the contour of the crushing. The fuselage was broken approximately 3

feet aft of the cockpit. The aft fuselage section and empennage, which remained partially attached to the forward fuselage, was lying inverted over the left wing about 5 feet outboard of the fuselage. The canopy release lanyard was found pulled, and, according to U.S. Navy medic personnel who were the first persons to reach the accident scene, was laying on the ground adjacent to the cockpit when they arrived.

According to an investigator from the Douglas County (Nevada) Sheriff's Department who was among the initial responders to the accident scene, the pilot was found in the cockpit of the aircraft, seated upright, with his parachute on and the seat belt restraint system fastened.

The aircraft was examined by the Safety Board on April 24, 1997, in storage at Minden, Nevada. The flight control system was substantially damaged in the cockpit and center fuselage area. The cockpit control tubes between the control stick translating assembly and the aft cockpit bulkhead and the spoiler actuating tube were bent approximately 45 degrees to the right, and the control stick was broken from the translating assembly. The fracture surfaces were bright and shiny. In the fuselage center section, the aileron push-pull tube exhibited compressive buckling and one end of the tube section from the cockpit was broken off at a weld where it attaches to the intermediate bellcrank. This fracture was also bright and shiny. Both the elevator and spoiler control mechanism were mechanically continuous, however, the composite reinforcements that support the intermediate bellcranks for both controls had separated from the fuselage side wall. The rudder assembly was bent in the forward direction and the aft-most hole used to position the rudder pedals was deformed in the forward direction.

The canopy Plexiglas was broken from the frame, and the frame was broken in the right front and remained joined by the canopy jettison control cable. Approximately 40 percent of the canopy Plexiglas was present, typically in 8-inch pieces and there were no marks on the pieces examined. The rear canopy release latch and operating mechanism were intact and undamaged. The release handle, cable, and retaining pin operated freely and the pin and the hole it engages appeared undamaged. The tube which attaches the forward canopy to the canopy hinge was broken at it's midpoint and the upper portion of the tube along with the jettison assist coil spring were not located at the storage location. The horizontal stabilizer had abrasions to the leading edge on the right and left outboard sections. The distance between the abraded areas approximately equaled the length of the canopy frame, and the black paint transferred to the stabilizer approximated that on the canopy frame interior. There were also three small punctures on the upper surface of the horizontal stabilizer. One of the punctures was round and had red material in it approximately the color of the canopy release knob. About 4 inches away was a lengthwise puncture with black marking. The distance between the two punctures was approximately equal to the distance from the canopy release knob to the end of the fractured canopy rail.

While inspecting the aircraft in the hangar, the Safety Board found a Phillips-type screwdriver and some rope in the fuselage center section, aft of the cockpit, in proximity of the flight control linkage. There were no fresh marks or gouges on the screwdriver and the rope was not

entangled in the control mechanism. There were no discernible marks on the flight control linkage from the screwdriver. The operator of the aircraft confirmed the items were his and had been used, and presumably placed in the open aft fuselage, during the recovery. Another person who participated in the aircraft recovery and was a former employee of the operator, reported that the only tools used were a hacksaw, dikes, and perhaps pliers. He could not recall any use of a screwdriver, and had no recollection of seeing any bundle of old tow rope or a screwdriver. A person familiar with the type aircraft said that there is no use for a Phillips-head screwdriver on the aircraft except to open the panels on the shelf behind the pilot's head.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed by the Douglas County Sheriff-Coroner's Office and toxicology tests were performed by the FAA Civil Aeromedical Institute in Oklahoma City, Oklahoma.

The Coroner's Report from the Douglas County Sheriff's Department noted that there were three lacerations on the pilot's face. A laceration of about 2 inches was located above the right eye, running from the right eye socket toward the top of the head. Another laceration of about 1.5 inches in length was to the right of his nose, and a third laceration of about 3 inches was located on the bottom right side of his mouth, running from the bottom lip area to the chin. There was also a fourth laceration of about 4 inches in length on his left cheek.

In his factual report, the NTSB Medical Officer states: "According to the autopsy report, the pilot's face had several large lacerations and abrasions with minimal associated hemorrhage. A large bruise was described on the forehead as: 'Covering the front of the forehead, almost paralleling the eyebrows, is a 10.0 x 6.0 cm. area of confluent purple-gray abrasion superimposing contusion.' This is the only contusion described on the head in the autopsy report."

The Medical Officer further states (in part): "Photographs from the scene and from the coroner's office demonstrate: The described contusion on the forehead is clearly visible in all photographs of the face, as are the massive lacerations to the face. . . . There is no blood apparent on a clearly visible neatly trimmed mustache or anywhere else on the face."

The shape and size of the contusion on the pilot's forehead was similar to the inside surface of the forward end of the canopy frame.

ADDITIONAL INFORMATION

The NTSB did not take possession of the wreckage. The wreckage was examined by the NTSB on April 24 and 25, 1997 in Minden, Nevada, while the wreckage was in the custody of Mr. Marvin Rogge, Rogge Insurance Adjusters. The NTSB did take custody of the Cambridge Aero Instruments "GPS Secure Flight Recorder" which was returned and released to Mr. Rogge on May 12, 1997.

Pilot Information

Certificate:	Private	**Age:**	54,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 29, 1996
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	175 hours (Total, all aircraft), 1 hours (Total, this make and model), 121 hours (Pilot In Command, all aircraft), 13 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Glaser-Dirks	**Registration:**	N70644
Model/Series:	DG-300 DG-300	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	3E32
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	February 5, 1997 Annual	**Certified Max Gross Wt.:**	1157 lbs
Time Since Last Inspection:	15 Hrs	**Engines:**	Unknown
Airframe Total Time:	2195 Hrs	**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	PM SERVICES, INC.	**Rated Power:**	
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:	TVL ,6264 ft msl	**Distance from Accident Site:**	19 Nautical Miles
Observation Time:	15:47 Local	**Direction from Accident Site:**	236°
Lowest Cloud Condition:	Scattered / 3500 ft AGL	**Visibility**	30 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	10°C / -8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(MEV)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:10 Local	**Type of Airspace:**	Class G

Airport Information

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

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:**	39.009986,-119.750831(est)

Administrative Information

Investigator In Charge (IIC):	Parker, Richard
Additional Participating Persons:	JOHN THORPE; RENO , NV
Original Publish Date:	October 28, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=29615