Aviation Investigation Final Report

Location:	SHELTON, Washington	**Accident Number:**	SEA96FA186
Date & Time:	August 10, 1996, 19:15 Local	**Registration:**	N90865
Aircraft:	Let L-13	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After receiving a glider certification on 7/24/96, the pilot (plt) logged about 2.1 hrs in a Let L-13 glider, before flying it solo. The initial solo was the accident flight (flt) on 8/10/96. On this flight, the plt planned to be towed to traffic pattern altitude, then release the glider, enter the traffic pattern, & land. Release occurred about 3 mi southwest of the airport at 1,850 ft. Airport elevation was 269 ft. Witnesses said the L-13 entered a right spin about 5 to 10 sec after release & continued spinning until ground impact. To keep the center-of-gravity (CG) from exceeding the aft limit, a placard had been installed in the cockpit, indicating the minimum front seat solo weight to be 150 lbs. The L-13's operating manual contained this & other info based on the L-13's original weight & balance (W/B) configuration. The plt weighed between 128 & 135 lbs, & a single 25 lb ballast bag was found in the wreckage. However, after repainting & modification with a non-standard tailwheel, the glider's revised W/B data indicated the current minimum front seat solo weight was 181 lbs. Based on this info (kept in the operator's maintenance shop), the glider's C.G. was computed to be 1.4 inches behind the aft limit. The plt's personal copy of the L-13 operating manual did not contain the revised W/B data. Copies of the glider's operating manual were being sold to renters without this info.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: failure of the operator to provide its pilots with information essential for an accurate determination of the glider's weight and balance, the resultant operation of the glider with a center-or-gravity that exceeded the aft limit, and the pilot's inadvertent entry into a stall/spin. Factors relating to the accident were: an incorrect placard concerning the glider's minimum front seat solo weight limitation, and the pilot's lack of experience in the make and model of aircraft.

Findings

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

Findings
1. MAINTENANCE - PERFORMED
2. (C) INFORMATION - NOT ISSUED - COMPANY/OPERATOR MANAGEMENT
3. (F) FLIGHT MANUALS - NOT CORRECTED
4. (F) MISC EQPT/FURNISHINGS,PLACARD/LABEL/MARKING(S) - INCORRECT
5. (C) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED
6. (C) STALL/SPIN - ENCOUNTERED - PILOT IN COMMAND
7. (F) LACK OF TOTAL EXPERIENCE IN TYPE OF AIRCRAFT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On August 10, 1996, approximately 1915 Pacific daylight time, a Czechoslovakian-manufactured LET L-13 Blanik glider, N90865, being operated by Olympic Air, Inc. of Shelton, Washington, was observed by witnesses to abruptly enter a rapid descent from a right turn, 5 to 10 seconds after releasing from an aero-tow 3 miles southwest of Sanderson Field, Shelton. The aircraft was observed to continue in this rapid descent until it impacted in an area of dense vegetation which according to the towplane pilot was almost directly under the release point. The glider was substantially damaged and the recently certificated private glider pilot, the sole occupant, was fatally injured. According to the towplane pilot, the flight was planned as a local 14 CFR 91 flight from Shelton. Visual meteorological conditions existed and no flight plan had been filed.

In an interview with the towplane pilot on the day after the accident, the towplane pilot stated that the accident pilot's planned flight profile was to be an aerotow to traffic pattern altitude, followed by release, entry into the Sanderson Field airport traffic pattern, and landing. He stated that the aerotow and release were uneventful and routine, and that the release occurred at an altitude of 1,850 feet and an airspeed of 80 to 85 MPH (70 to 74 knots.)

One ground witness stated that during the rapid descent, he saw the glider turning slowly to the right. Another individual, the pilot of an airplane carrying parachute jump students over Sanderson Field, stated that he observed the release, and that 5 to 10 seconds later he saw an object "corkscrewing" down to earth in the vicinity of the release point.

The accident occurred during the hours of daylight at approximately 47 degrees 12 minutes North and 123 degrees 12 minutes West.

PERSONNEL INFORMATION

The pilot received her FAA private glider pilot certificate on July 24, 1996, 17 days before the accident. The pilot's logbooks indicated that the majority of her glider experience and training, including her first solo and her FAA practical glider test, had been obtained in the Schweizer 2-33. The pilot had logged a total of 2 hours and 4 minutes of L-13 time, including 40 minutes logged as pilot-in-command (PIC). The first L-13 flight had been logged on June 9, 1996, with the most recent L-13 flight being the 40 minutes logged as PIC, on July 27, 1996.

The pilot's aircraft checkout records at Olympic Air contained no documentation of her being checked out to act as PIC of Olympic Air's L-13 per Olympic Air's company operating procedures. Olympic Air's glider instructor stated to the NTSB investigator-in-charge that he

had flown with the accident pilot on certain flights before the day of the accident, but had not yet signed her off to act as PIC of the L-13 as he was not yet satisfied with her level of takeoff and landing proficiency on the glider. The glider instructor stated that the events leading up to the accident flight, consisting (to his knowledge) of a flight or flights with the towplane pilot (who was another Olympic Air pilot and a recently certificated commercial glider pilot, but not a glider instructor) followed by the solo flight during which the accident occurred, took place after the glider instructor had left for the day, without the glider instructor's prior knowledge. The glider instructor stated that to his knowledge, the accident flight was the accident pilot's first attempt to fly the L-13 solo.

AIRCRAFT INFORMATION

The "Pilot's Notes for the L-13 Sailplane" (the FAA-approved operating manual for the aircraft) states that the minimum front seat weight for solo for the type is 150 pounds. However, the copy of this manual furnished by the operator to investigators after the accident contained weight and balance computations, along with a weight and balance envelope applicable specifically to N90865, appended to the back of the manual. This additional airframe-specific weight and balance data indicated that for the accident aircraft, the minimum front seat solo weight was 181 pounds. The L-13's FAA type certificate data sheet (No. G24EU) states that the "Pilot's Notes" must be carried in the glider as required equipment. However, Olympic Air's glider instructor stated to the NTSB investigator-in-charge that the manual was not carried in N90865, since the requirement to present operating limitations in the aircraft "was satisfied by placards."

In a telephone conversation with the president of Olympic Air on May 8, 1997, the president could not recall where the manual which contained the additional weight and balance data had been kept at the time of the investigators' on-site examination, but expressed a belief that it had been kept in the facility's flight training area. Olympic Air's glider instructor subsequently reported in a telephone conversation on May 20, 1997, that he had determined that this manual had been kept in Olympic Air's maintenance shop. The glider instructor stated that this location was accessible to renter pilots, but was not an area routinely used by pilots for preflight planning. The president of the company stated in his May 8 telephone conversation that it would be "fairly accurate" to characterize Olympic Air's personnel as being unaware of the airframe-specific weight and balance data's existence.

The pilot weighed 135 pounds according to her driver's license and 128 pounds according to her FAA medical certificate. A single 25-pound ballast bag was found in the aircraft wreckage. Based on the aircraft-specific empty weight and balance data and the known loading conditions, the accident aircraft's center-of-gravity (CG) was determined to be approximately 1.4 inches aft of the aft limit at the time of the accident. It was not determined whether the CG was aft of the aircraft's stick-fixed neutral point (an aircraft with its CG aft of this point exhibits negative static longitudinal stability; i.e. it is statically unstable.) However, the Soaring Flight Manual (Jeppesen Sanderson, 1993) states: "An excessive aft CG may cause a condition of neutral stability or instability....In this event, additional forward stick movement may not be

available to recover from a stall/spin situation." Stick force per G is reduced (i.e. control responsiveness increases) as an aircraft's CG is moved aft, until the CG reaches the neutral point (where stick force per G is decreased to zero.) Both seats in the L-13 are located forward of the aircraft's empty CG; thus, the CG of the aircraft with a pilot in the front seat and an empty rear seat is aft of the CG of the same aircraft with the same front-seat pilot plus a rear-seat occupant.

The L-13's wings-level, flaps-up stall speed is 32 knots indicated airspeed (IAS), and its maximum aerotow airspeed (per the L-13 pilot's manual) is 76 knots IAS.

WRECKAGE

The glider wreckage was examined at the accident site on August 11, 1996. The examination of the wreckage revealed no evidence of preimpact airframe or flight control malfunction, or of preimpact structural failure. The wreckage site was in an area of dense vegetation and woods in level to rolling terrain. The entire glider was found within approximately 20 feet of the main aircraft wreckage, which comprised the entire glider less outboard wing sections and right aileron. The inboard sections of both wings, joined by the wing spar, were separated from, but adjacent to, the fuselage, with the left wing displaying leading edge damage and the right wing displaying trailing edge damage. Both wings were fractured chordwise in mid-span, and both separated outboard wing sections were located within 20 feet of the main wreckage. The right aileron, which was folded at a location corresponding to the right wing fracture location, was also separated from both right wing sections and was located approximately 20 feet from the main wreckage. The aft fuselage and empennage were twisted aft of the cabin area and bent forward and to the left of the cabin. Accordion damage on the outer skin on the left side of the cabin exhibited a crush angle of approximately 50 degrees with the canopy rail. The aircraft nose was pointed approximately 080 degrees magnetic.

A single 25-pound ballast bag was found in the wreckage. It was noted that the entire glider had been painted, and that the glider had been modified with a non-standard tailwheel installation. A placard indicating the type-standard 150-pound minimum front seat solo weight limitation was affixed to the aircraft's instrument panel.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed under the authority of the Mason County Coroner at the McComb Funeral Home, Shelton, Washington, on August 11, 1996. The cause of death was ruled as "massive multiple injuries sustained as the pilot of a glider airplane which allegedly took a nose dive and crashed."

Toxicology tests on the pilot were conducted by the FAA Civil Aeromedical Institute (CAMI), Oklahoma City, Oklahoma. The tests screened for the presence of carboxyhemoglobin, cyanide, ethanol, and drugs and did not detect any of these substances.

ADDITIONAL INFORMATION

The accident pilot's mother forwarded a copy of the "Pilot's Notes for the L-13 Sailplane" which had belonged to the accident pilot. The pilot's copy of the manual contained only the type-standard operating limitations with respect to weight and balance, and did not incorporate the additional weight and balance data pertinent specifically to N90865. It was not determined where the pilot obtained her copy of the L-13 pilot's notes. Olympic Air's glider instructor stated to the NTSB investigator that Olympic Air sold copies of the pilot's notes to its renters, but that those copies did not include the airframe-specific weight and balance data for N90865.

The glider wreckage was released to Mr. Tracy Barrus of Barrus & Stiger, Bellevue, Washington, on June 3, 1997. Mr. Barrus is the insurance adjuster representing Olympic Air.

Pilot Information

Certificate:	Private	**Age:**	36,Female
Airplane Rating(s):	None	**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:**	September 26, 1995
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	40 hours (Total, all aircraft), 2 hours (Total, this make and model), 4 hours (Pilot In Command, all aircraft), 2 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Let	**Registration:**	N90865
Model/Series:	L-13 L-13	**Aircraft Category:**	Glider
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	025726
Landing Gear Type:		**Seats:**	2
Date/Type of Last Inspection:	October 20, 1995 Annual	**Certified Max Gross Wt.:**	1102 lbs
Time Since Last Inspection:	21 Hrs	**Engines:**	Unknown
Airframe Total Time:	3083 Hrs	**Engine Manufacturer:**	
ELT:	Not installed	**Engine Model/Series:**	
Registered Owner:	OLYMPIC AIR INC.	**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
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:	OLM ,206 ft msl	**Distance from Accident Site:**	18 Nautical Miles
Observation Time:	18:56 Local	**Direction from Accident Site:**	119°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	330°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	32°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(SHN)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	19:00 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	SANDERSON FIELD SHN	**Runway Surface Type:**	
Airport Elevation:	269 ft msl	**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:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	47.22945,-123.200958(est)

Administrative Information

Investigator In Charge (IIC):	Nesemeier, Gregg
Additional Participating Persons:	CHARLES COX; RENTON , WA
Original Publish Date:	January 30, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=42286