



Aviation Investigation Final Report

Location:	Richfield, Utah	Accident Number:	WPR18LA177
Date & Time:	June 21, 2018, 15:27 Local	Registration:	N16DN
Aircraft:	SCHEMPP HIRTH FLUGZEUGBAU GMBH ARCUS M	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot of the glider reported that he was circling in thermal lift, approaching an altitude of 17,000 feet mean sea level, when one of the rudder pedals "slammed back" and threw his foot off the pedal, accompanied by a "thud" sound. The pilot reported that there was no change in the glider's yaw, pitch, or bank angle, but that he was unable to move the rudder pedals. Shortly thereafter, the glider's bank angle and speed began to increase, and the pilot applied corrective actions; however, he was unable to recover. The pilot instructed the passenger to bail out, and as he jettisoned the canopy, the glider began to break up. The pilot and passenger egressed and landed under parachute, incurring minor injuries.

Postaccident examination of the recovered wreckage, including the flight control system, revealed no evidence of any preexisting mechanical malfunction or anomalies. Based on the available information, the reason for the inflight loss of control could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

An inflight loss of control and subsequent inflight breakup for reasons that could not be determined based on the available information.

Findings

Not determined	(general) - Unknown/Not determined
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Factual Information

History of Flight

Maneuvering	Loss of control in flight (Defining event)
Maneuvering	Aircraft structural failure

On June 21, 2018, about 1527 mountain daylight time, a Schempp-Hirth Arcus M motorglider, N16DN, was destroyed when it was involved in an accident near Richfield, Utah. The pilot and passenger sustained minor injuries. The glider was operated as a Title *14 Code of Federal Regulations* Part 91 personal flight.

The pilot was participating in a soaring competition and stated that it was a "very good soaring day." The pilot reported that he was "climbing stably" in thermal lift approaching about 17,000 feet mean sea level (msl) when one of the rudder pedals "slammed back" and threw his foot off the pedal, accompanied by a "thud" sound. He could not recall which direction the rudder pedals moved and added that, when this occurred, there was no change in the glider's yaw, pitch, or bank angle; however, he was unable to move the rudder pedals. Shortly thereafter, the glider's bank angle and speed began to increase, and the pilot thought that the glider had entered a spin or spiral dive. The pilot applied corrective flight control inputs, but was unable to recover, and instructed the passenger to bail out. The pilot stated that as he jettisoned the canopy, "the wing broke" and he and his egressed.

The wreckage debris field was located within mountainous terrain about 7 miles southeast of Richfield. The wings separated from the glider during the accident sequence and were located about one mile from the main wreckage, which comprised the empennage and a portion of the fuselage. The vertical stabilizer was laying on its right side, the right horizontal stabilizer was folded under the vertical stabilizer, the damaged rudder was partially attached, and the elevators were adjacent to the horizontal stabilizer. The wreckage was recovered to a secure location for further examination.

Examination of the recovered wreckage revealed that the upper three inches of the rudder were separated. The left and right elevators were not identified within the recovered wreckage. The empennage was fractured from the fuselage just forward of the vertical stabilizer but remained attached by the control rods and cables. The vertical stabilizer was fractured near the mid-span point with a corresponding fracture of the rudder. The horizontal stabilizer remained attached to the top of the vertical stabilizer and was engaged with the forward and aft mount points. The elevator hinges on the horizontal stabilizer were all intact and undamaged.

The elevator aft fuselage forward control rod was fractured in three places and the remaining elevator control system was intact. There were several areas of damage and deformation of the elevator flight controls adjacent to areas of fuselage damage. The elevator trim locking control rod was near the aft most position.

The aileron controls were fractured and deformed in multiple places between the forward control stick and the tunnels, consistent with the extensive forward fuselage damage; however, all the components were present with the exception of a portion of the outboard aileron control rod, which was not located within the recovered wreckage. The fractures all had a dull, grainy appearance consistent with overstress separation.

The forward and aft rudder pedal assemblies were deformed and fractured into multiple places. The left and right forward and aft rudder cables remained attached to their respective anchor points; however, the anchor points were fractured from the fuselage. The right rudder cables were intact from the pedals to the rudder control horn. The left forward pedal rudder cable was fractured near the pedal with a splayed, broomstraw appearance consistent with tension overload. The left rudder cables were otherwise intact from the pedals to the rudder control horn. The rudder stops at the rudder control horn each had evidence of a single impact.

The upper rudder hinge pin assembly on the vertical stabilizer was fractured and deformed upward. The upper rudder hinge bearing was fractured from its mounting plate on the rudder. There was corresponding damage to the lower portion of the upper rudder hinge cutout. The rudder control horn was intact and attached to the rudder. For additional information, refer to the Airworthiness Group Chairman's Factual Report located in the public docket for this accident.

Pilot Information

Certificate:	Commercial	Age:	61, Male
Airplane Rating(s):	None	Seat Occupied:	Front
Other Aircraft Rating(s):	Glider	Restraint Used:	4-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	April 9, 2017
Flight Time:	4512 hours (Total, all aircraft), 312 hours (Total, this make and model), 4470 hours (Pilot In Command, all aircraft), 92 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	SCHEMPP HIRTH FLUGZEUGBAU GMBH	Registration:	N16DN
Model/Series:	ARCUS M NO SERIES	Aircraft Category:	Glider
Year of Manufacture:	2015	Amateur Built:	
Airworthiness Certificate:	Experimental (Special)	Serial Number:	125
Landing Gear Type:	Retractable - Tailwheel	Seats:	2
Date/Type of Last Inspection:	February 23, 2018 Condition	Certified Max Gross Wt.:	1764 lbs
Time Since Last Inspection:	1.1 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	308 Hrs at time of accident	Engine Manufacturer:	Solo
ELT:	C126 installed, not activated	Engine Model/Series:	262502I
Registered Owner:	On file	Rated Power:	
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KMLF, 5033 ft msl	Distance from Accident Site:	52 Nautical Miles
Observation Time:	21:26 Local	Direction from Accident Site:	251°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	24 knots / 30 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	200°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	37°C / -10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Nephi, UT (U14)	Type of Flight Plan Filed:	None
Destination:	Nephi, UT (U14)	Type of Clearance:	None
Departure Time:	13:00 Local	Type of Airspace:	Class E

Airport Information

Airport:	NEPHI MUNI U14	Runway Surface Type:	
Airport Elevation:	5022 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Minor	Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	38.697223,-111.96971(est)

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Kent Gibbons; Federal Aviation Administration; Salt Lake City, UT Christoph Wannemacher; Schempp-Hirth; Kirchheim Dietmar Nehmsch; German Federal Bureau of Aircraft Accident Investigation; Braunschweig
Original Publish Date:	May 25, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97551

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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](#).