

National Transportation Safety Board
Office of Research and Engineering
Washington, D.C. 20594

Performance Study

Specialist Report
Marie Moler

A. ACCIDENT

Location: Spokane, Washington
Date: May 7, 2015
Time: 1604 PDT
Airplane: Piper PA 46-350P, N962DA
NTSB Number: WPR15FA158

B. GROUP

No vehicle performance group was formed.

C. SUMMARY

On May 7, 2015, at 1604 Pacific Daylight Time, a Piper PA 46-350P, N962DA, collided with water in the Spokane River following an attempted landing at Felts Field Airport, Spokane, Washington (SFF). The airplane was owned by Flying Colors Aviation LLC, and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91. The commercial pilot and pilot-rated passenger sustained fatal injuries and the airplane was destroyed during the impact sequence. The local flight departed Felts Field at 1553. Visual meteorological conditions prevailed and no flight plan had been filed.

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RADAR STUDY

Radar data used in this study is from the Spokane International Airport in Spokane, Washington, coded as GEG. The ASR-9 (airport surveillance radar) sampled at a frequency of every 4.5 seconds. The radar was approximately 10 nautical miles (NM) from the aircraft's final location. These radar have approximately a 60 NM range and an inherent uncertainty of ± 2 Azimuth Change Pulses (ACP) = $\pm (2 \text{ ACP}) \times (360^\circ/4096 \text{ ACP}) = \pm 0.176^\circ$ in azimuth, ± 50 ft in altitude, and $\pm 1/16$ NM in range.

Times in the study are reported in PDT.

Weather Observation

The weather conditions reported at SFF at 1553 were winds from 20° at 7 knots, 10 miles prevailing visibility with few clouds at 7,000 feet. The temperature was 71°F , the dew point was 26°F , and the altimeter pressure was 29.93 inHg.

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Aircraft Flight Path, Altitude, and Groundspeed

The radar track for the flight is shown in Figure 1. The aircraft took off from SFF at 1553, climbed and turned to the right before experiencing a sudden, tight right turn, and loss of altitude, shown in Figure 2. After regaining altitude, the aircraft continued flying to the west before completing a left turn to align with runway 22R for landing. The radar data ended 0.6 NM before the runway threshold. The aircraft collided with the river 1,300 ft to the right of the runway (Figure 3). The final mile of flight was not recorded by radar and was therefore not studied for this report.



Figure 1. Aircraft flight path from GEG radar and wreckage location. Flight path is counter-clockwise and SFF is in the lower left corner. Marked point is point of maximum altitude.

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Figure 2. Aircraft flight path from GEG radar focusing on the sudden right turn after take-off. Yellow arrows indicate flight path.

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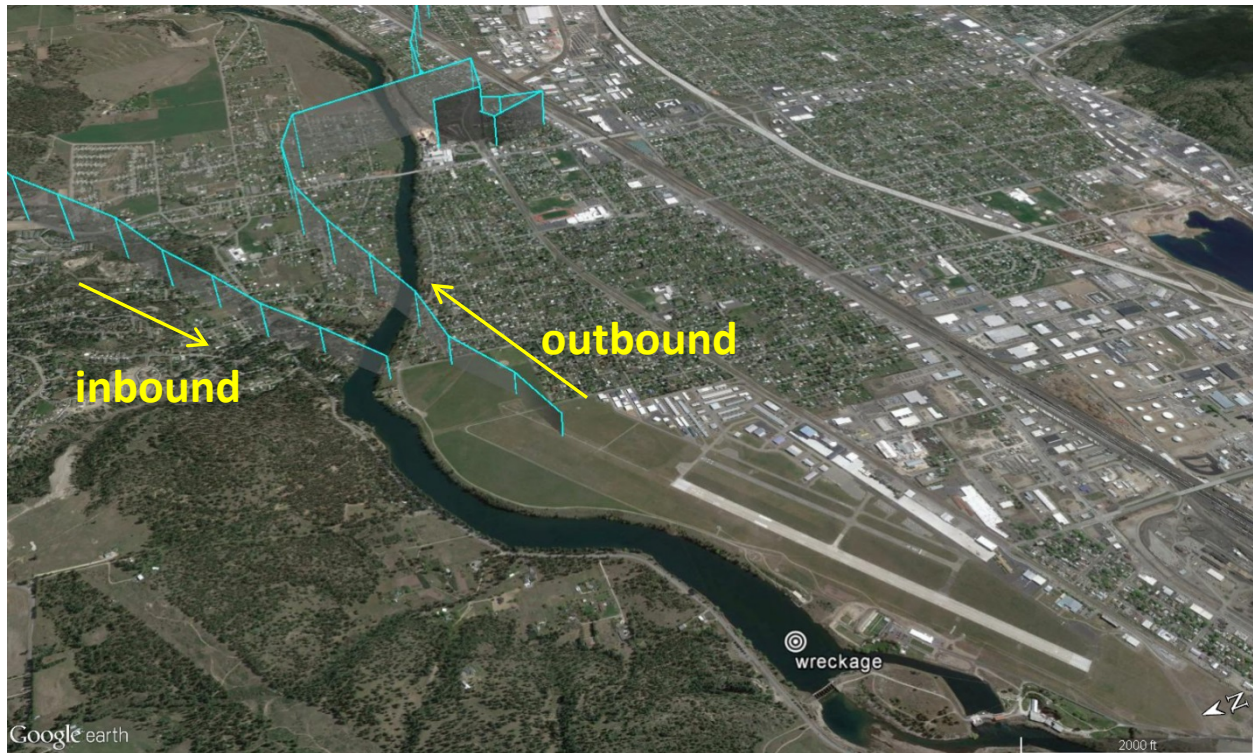


Figure 3. Aircraft flight path from GEG radar and wreckage location. Flight path direction shown by yellow arrows.

The aircraft's rate of climb and speeds were calculated using the radar data and are shown in Figure 4. The aircraft had reached an altitude of 3,000 ft and an airspeed of about 140 kts before the early hard right turn. During the event, the aircraft lost 700 ft of altitude and the airspeed dropped to just below 80 kts. After the aircraft recovered, it resumed climbing, reaching a maximum altitude of 5,600 ft and a speed of approximately 190 kts at 15:59. The aircraft's reported stall speed is 58 kts and cruise speed is 196 kts.

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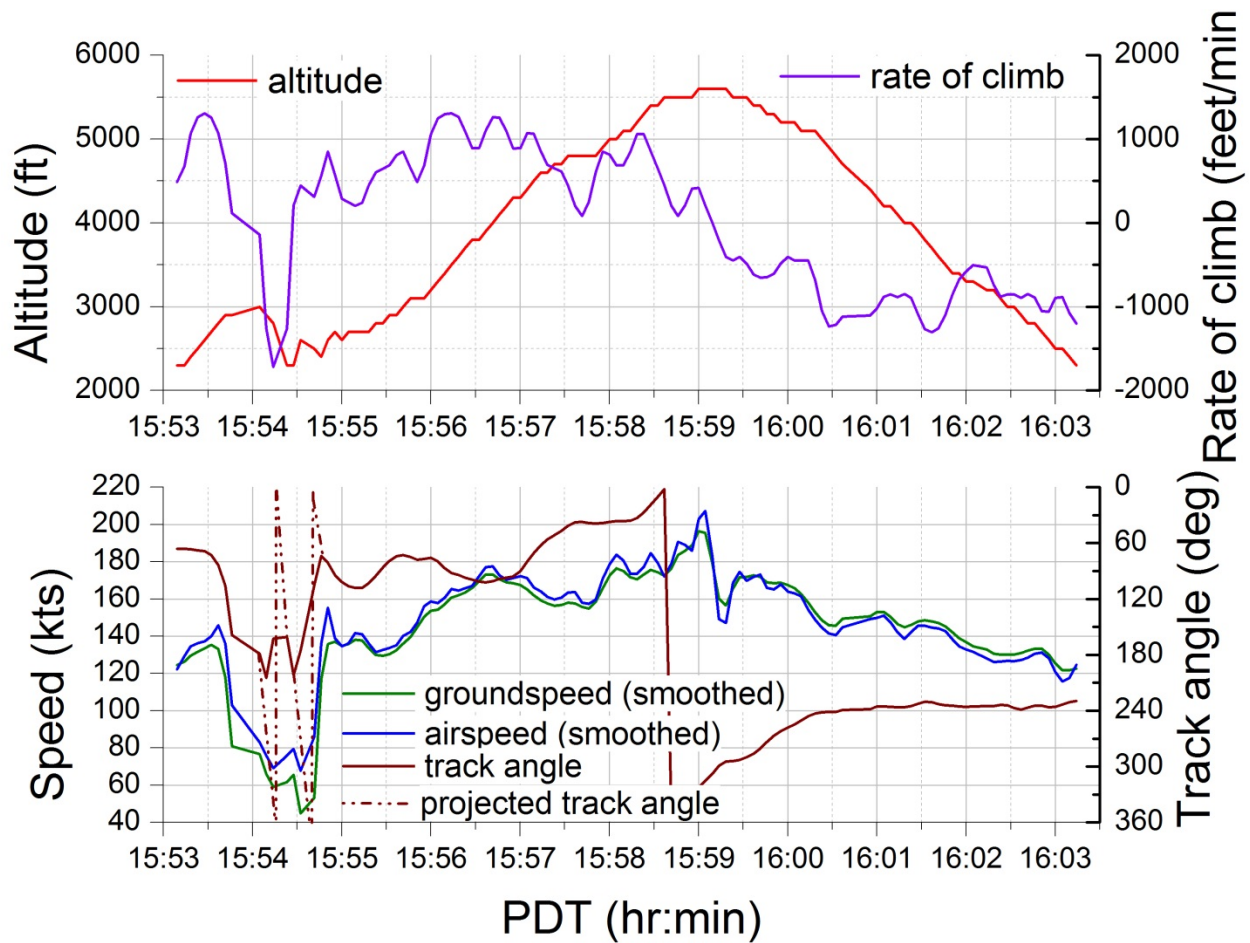


Figure 4. Aircraft’s altitude from radar with its calculated rate of climb, groundspeed, airspeed, and track angle. Due to the radar sample rate the track angle does not accurately show the two full turns the aircraft completed early in the flight. The dotted projected track angle has been added to the plot to better illustrate this event.

After 15:59, the aircraft completed its turn onto final for runway 22R while descending and reducing speed. For the final six nautical miles of recorded flight, the aircraft’s track angle was steady on about 235° (runway 22R’s true heading is 234°) and was descending at a rate of 1000 ft/min. The final calculated speed was about 120 kts. The aircraft’s glide slope is shown in Figure 5. The glide path for runway 22R is 3.5°, so the aircraft’s glide slope was steeper than recommended.

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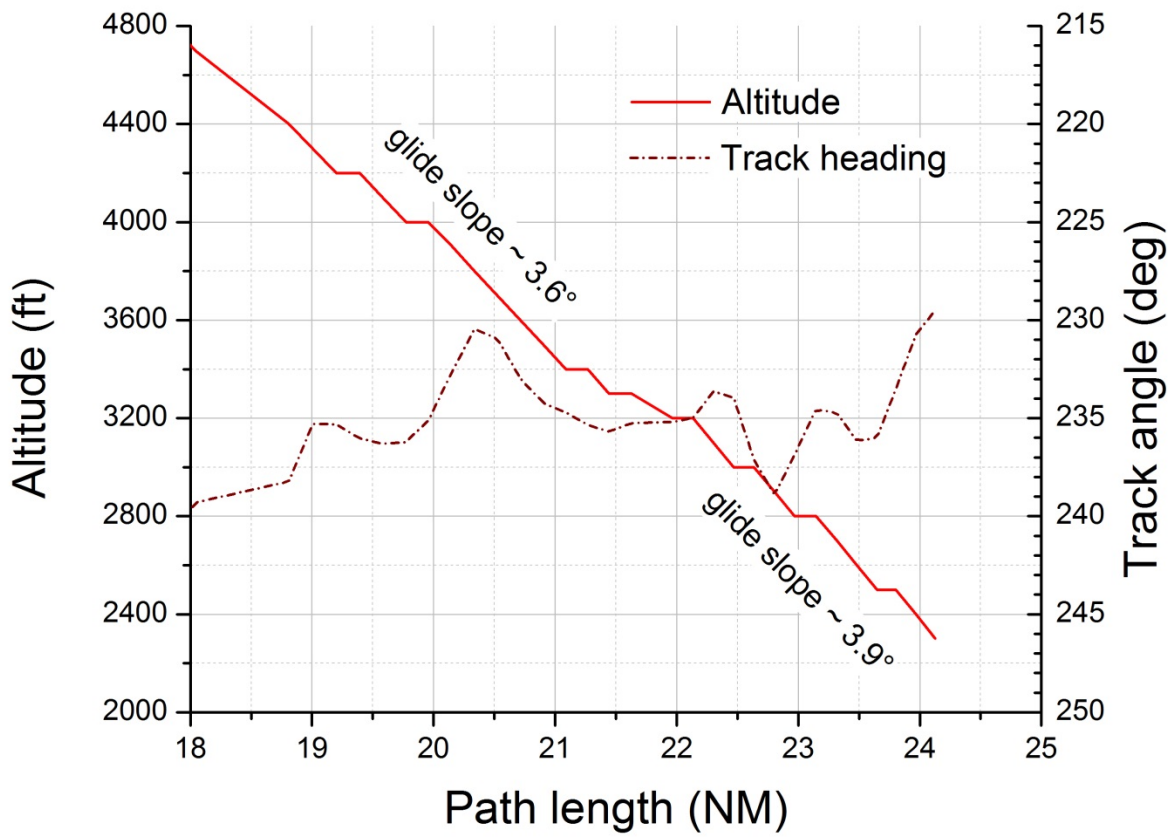


Figure 5. Aircraft's altitude and track angle versus path length. Calculated glide slopes shown.

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Aircraft Attitude Estimates

A simple aerodynamic model of a PA-46 was constructed to estimate likely heading and pitch attitudes of the aircraft during the early flight hard right turn. Figure 6 shows that during the initial climb and early turn, the aircraft's pitch remained below 10°. By 15:55:30 the aircraft had begun to regain altitude and speed.

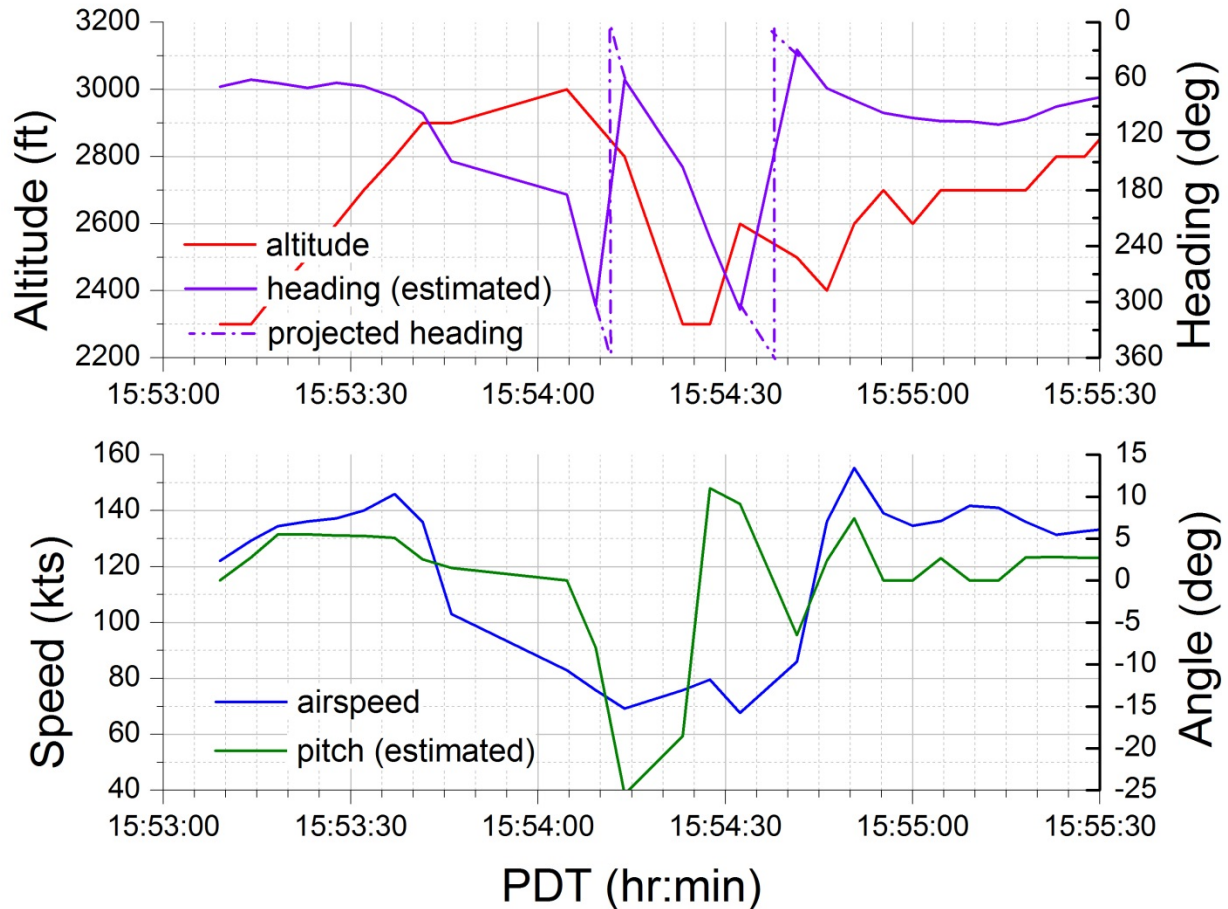


Figure 6. Estimated aircraft heading, altitude, speed, and pitch during early flight turn.

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D. CONCLUSIONS

The radar data from GEG show the aircraft climbing and increasing speed to 3000 ft and 140 kts before experiencing a sudden right turn and a loss of 700 ft of altitude and 60 kts of airspeed. The aircraft recovered, climbed to 5600 ft and 190 kts, and completed a turn onto final for runway 22R. The aircraft's approach was on a steady track and had a reasonable descent rate and speed, but the final nautical mile of flight was not recorded by radar.

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