

National Transportation Safety Board

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AIRCRAFT PERFORMANCE

Specialist's Study - Supplemental

February 27, 2025

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A ACCIDENT

Location: Lake Placid, New York
Date: October 1, 2023
Time: 16:08 Eastern Daylight Time
20:08 UTC
Airplane: Cessna 177RG, N545PZ

B AIRCRAFT PERFORMANCE SPECIALIST

Specialist Carl Schultheisz
National Transportation Safety Board
Washington, DC

C SUMMARY

On October 1, 2023, at 16:08 Eastern Daylight Time (EDT), a Cessna 177RG, N545PZ, owned and operated by Lake Placid Air Service, was substantially damaged when it was involved in an accident near Lake Placid, New York. The pilot and pilot-rated passenger sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 aerial photography flight.

On September 17, 2023, the airplane departed Lake Placid and immediately returned to the airport. This supplement is focused on that flight.

D DETAILS OF THE INVESTIGATION

1.0 Airplane

Details of the airplane can be found in the Aircraft Performance Study. The weight and balance calculated with 40 gallons of fuel were also assumed for this evaluation.

2.0 Airport

The flight departed from runway 32 at LKP about 10:12 EDT and returned to land on runway 14. Details of the airport can be found in the Aircraft Performance Study.

3.0 Weather

Weather was recorded on September 17, 2023, at 09:51 EDT at Adirondack Regional Airport (SLK), which is about 13 NM northwest of Lake Placid. The winds

were 5 kts from 220°, visibility was 10 statute miles, a few clouds at 600 ft above ground level (AGL), temperature 12 °C (54 °F), dewpoint 11 °C (52 °F), and a barometric setting of 29.94 inHg.

4.0 Data

Date, time, latitude, longitude, altitude, groundspeed, and track angle were recorded by a Garmin GPSMAP 396 onboard the airplane. Details of the device and the download of the data can be found in the Global Positioning System Device – Specialist’s Factual Report [1] in the docket for this accident. Tabulated data for the accident flight and the flight on September 17, 2023 can be found in Attachments to that report [2,3], also in the docket for this accident.

Winds aloft, temperature, and pressure as functions of altitude were taken from a High-Resolution Rapid Refresh (HRRR) model sounding from the National Oceanic and Atmospheric Administration¹. The data were downloaded for coordinates 44.27° North, 73.97° West, at 16:00 EDT.

5.0 Calculations

The same simplified mathematical model of the airplane that was used for evaluation of the accident was used to calculate parameters that were not recorded by the GPSMAP 396. True airspeed is the vector difference between the groundspeed vector and the local wind vector; the local temperature and pressure are used to convert true airspeed to calibrated airspeed. The simplified mathematical model employs an assumption that there is zero sideslip, so that changes in heading are a result of rolling the airplane to redirect the airplane’s lift vector.

6.0 Flight Path

A view of the flight path on a Google Earth background is shown in Figure 1. The airplane lifted off from runway 32 shortly after 10:12:20 and continued to track the runway centerline until 10:13:03, when it began a left turn back to the airport, landing on runway 14 about 10:13:46.

¹ [READY Archived Meteorology](#)



Figure 1. Flight track on a Google Earth background. Annotations indicate the time EDT (hh:mm:ss) and recorded altitude (ft).

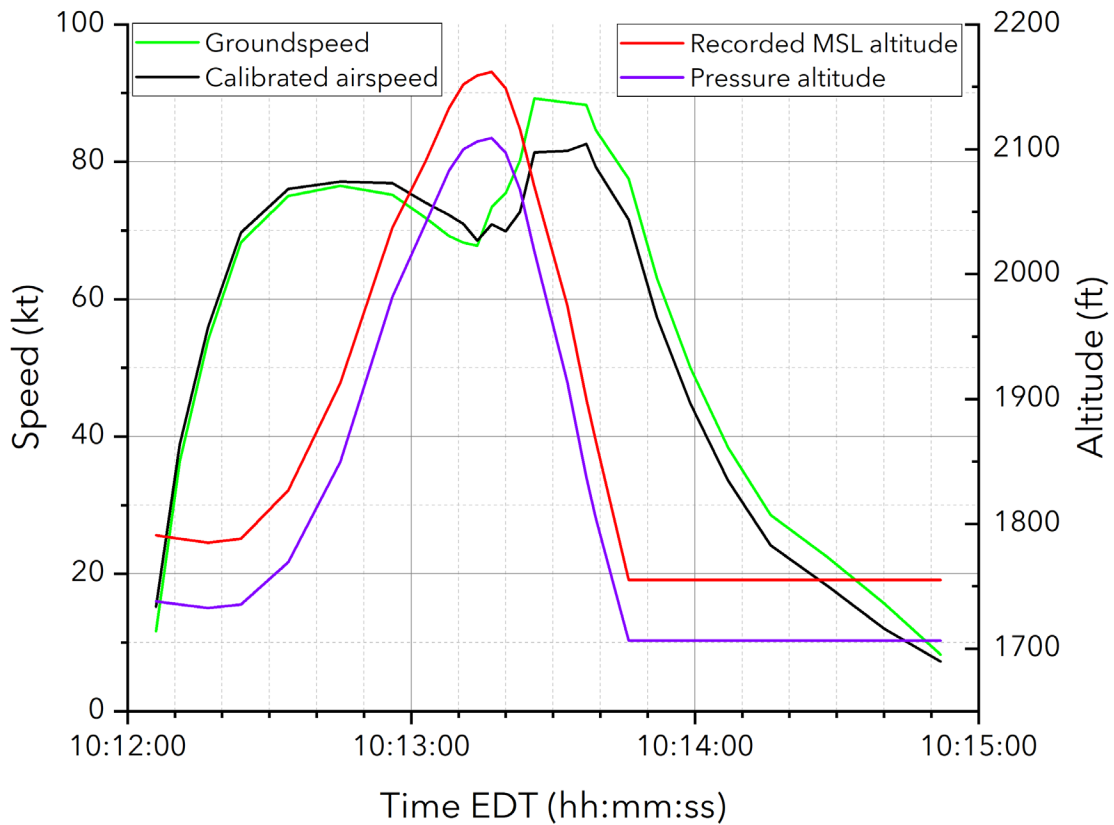


Figure 2. Groundspeed, calibrated airspeed, recorded MSL altitude and pressure altitude as functions of time.

Figure 2 plots the groundspeed, calibrated airspeed, recorded MSL altitude and pressure altitude for the flight as functions of time. The initial climb was accomplished at about 77 knots calibrated airspeed (KCAS), consistent with the guidance from the Pilot's Operating Handbook (POH) [4]. At 10:12:56, the airspeed began to decrease, reaching a minimum of 68.5 KCAS at 10:13:14. The airspeed then increased to over 80 KCAS, but decreased to 71.5 KCAS at the estimated touchdown time of 10:13:46.

The maximum recorded MSL altitude was 2162 ft at 10:13:17, or about 400 ft AGL.

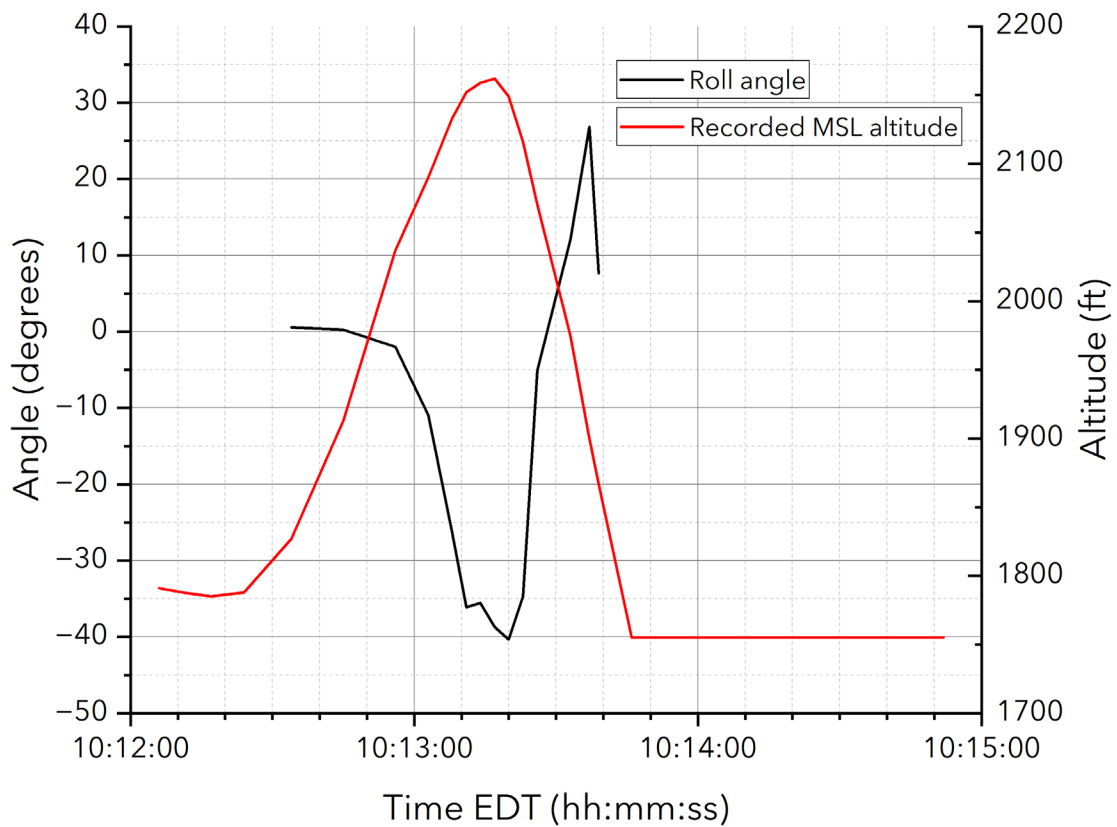


Figure 3. Roll angle and recorded MSL altitude as functions of time.

The airplane began a roll to the left at 10:12:56, reaching a roll angle of -40° at 10:13:20, before rolling back to the right, reaching a roll angle of 27° at 10:13:37 as the airplane aligned with runway 14.

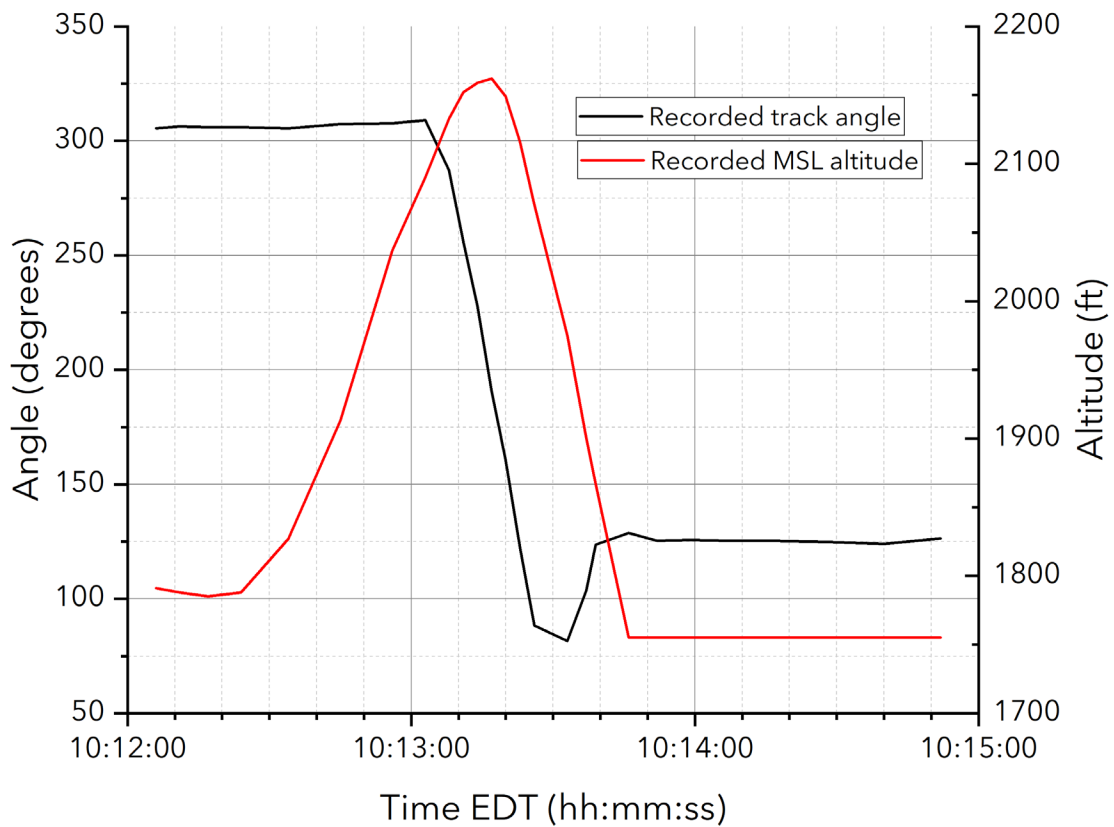


Figure 4. Recorded track angle and recorded MSL altitude as functions of time.

Figure 4 shows the recorded track angle as a function of time, along with the recorded MSL altitude. Between 10:13:03 and 10:13:25, the track angle changed by about $9.6^{\circ}/s$, as compared with a standard rate turn of $3^{\circ}/s$.

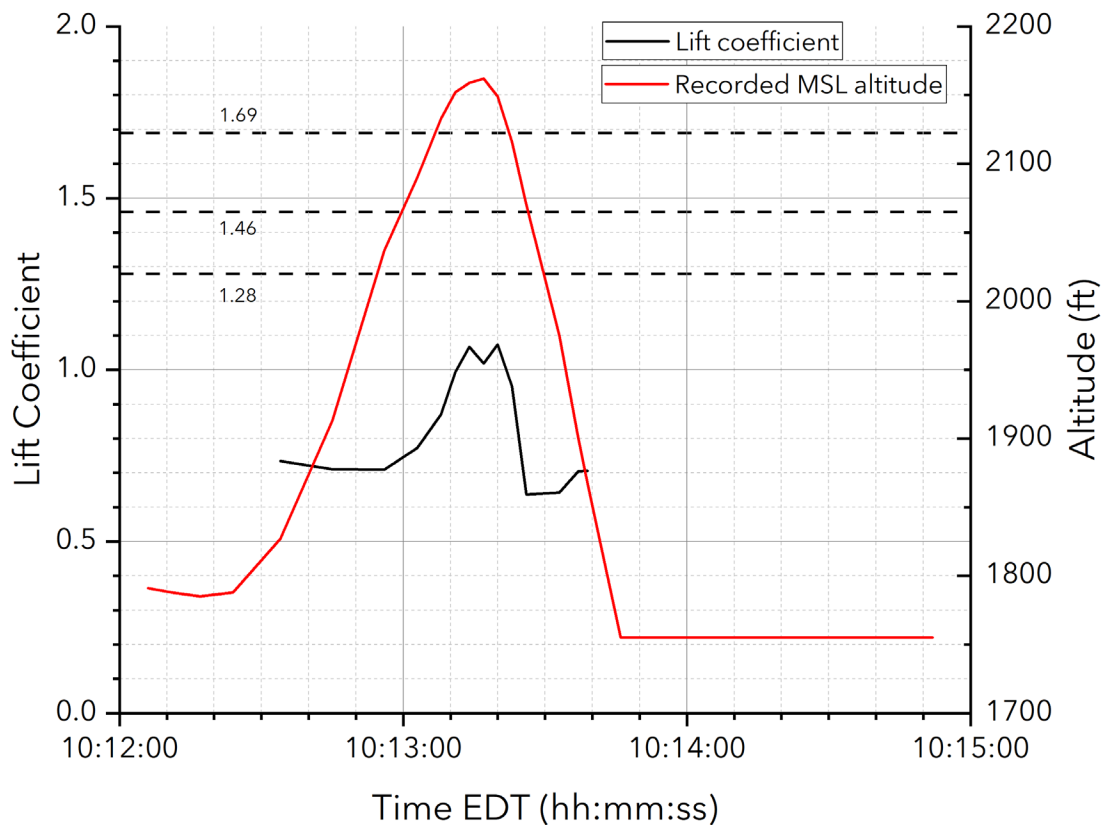


Figure 5. Lift coefficient and recorded MSL altitude as functions of time.

Figure 5 plots the lift coefficient and recorded MSL altitude as functions of time. The increase in lift coefficient at 10:12:56 corresponds to the change in roll angle at the same time. The lift coefficient remains well below the maximum lift coefficient C_{Lmax} calculated from the power-off, flaps-up, wings-level stall speeds in the POH, which was found to range from 1.28 to 1.46 for flaps up, and from 1.46 to 1.69 for flaps 10°, depending on the location of the center of gravity.

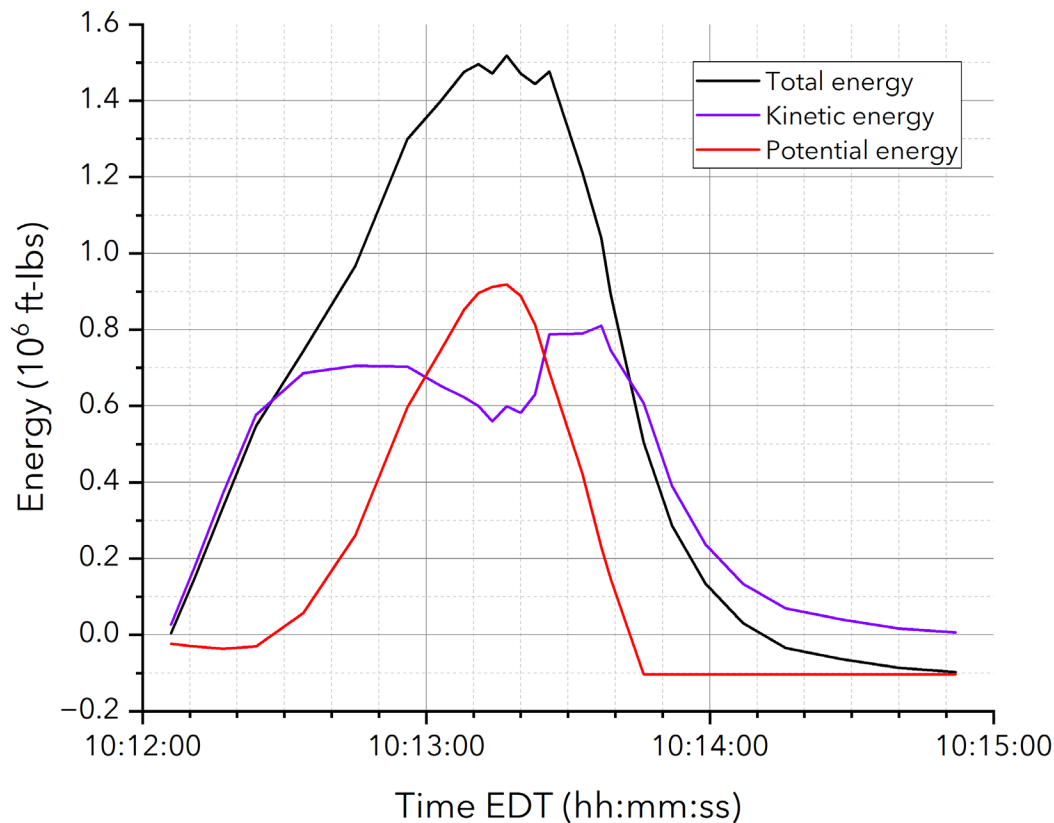


Figure 6. Potential energy, kinetic energy and total energy as functions of time.

Figure 6 plots the potential energy, kinetic energy and total energy (the sum of the potential and kinetic energy) as functions of time. The initial rate of increase in total energy is similar to the accident flight, but the total energy reaches a plateau and does not begin to decrease until the airplane is descending back toward the airport; the decrease in total energy is consistent with a reduction in engine power and/or increasing flap deflection as the airplane slows to land.

E DISCUSSION

The airplane lifted off from runway 32 shortly after 10:12:20, but it began a sharp roll to the left at 10:12:56, reaching a roll angle of -40° at 10:13:20, before rolling back to the right. The airplane then reached a roll angle of 27° at 10:13:37 as it aligned with runway 14. During the left turn, the track angle changed by about $9.6^\circ/\text{s}$, as compared with a standard rate turn of $3^\circ/\text{s}$. The airplane reached an altitude of about 400 ft AGL during the left turn and subsequently descended and landed on runway 14 about 10:13:46.

Submitted by:

Carl Schultheisz
Chief, Vehicle Performance Division

F REFERENCES

1. Global Positioning System Device – Specialist’s Factual Report, National Transportation Safety Board, Washington, DC, 2024.
2. Attachment 1 to Global Positioning System Device – Specialist’s Factual Report, National Transportation Safety Board, Washington, DC, 2024.
3. Attachment 2 to Global Positioning System Device – Specialist’s Factual Report, National Transportation Safety Board, Washington, DC, 2024.
4. Pilot’s Operating Handbook, Cessna Cardinal RG, 1976 Model 177RG, Cessna Aircraft Company, Wichita, Kansas, USA.