

National Transportation Safety Board

Office of Research and Engineering

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WPR22FA012

AUTOMATIC DEPENDENT SURVEILLANCE- BROADCAST (ADS-B) STUDY

Aircraft Performance Study

By

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A. ACCIDENT

Location: Three Points, Arizona
Date: October 17, 2021
Time: 1402 mountain standard time (MST)
Airplane: Rockwell International 112B, N112LS

B. SUMMARY

On October 17, 2021, about 1402 mountain standard time, a Rockwell International, 112B airplane, N112LS, was destroyed when it was involved in an accident near Three Points, Arizona. The pilot was fatally injured. The airplane was operated by the pilot as a Title 14 Code of Federal Regulations Part 91 personal flight.

C. PERFORMANCE STUDY

1.0 Aircraft

The Rockwell International 112 is a four-seat single-engine general aviation airplane also called a Rockwell Commander. A photo of the airplane is shown in Figure 1.



Figure 1. Rockwell International 112, N112LS.

2.0 Available Data

This performance study is based on Automatic Dependent Surveillance-Broadcast (ADS-B) data provided by the Federal Aviation Administration (FAA). ADS-B broadcasts an airplane's Global Positioning System (GPS) position and other data to the ground where it is recorded. The GPS position has an accuracy of approximately 20 meters (65 ft) in both the horizontal and vertical dimensions.

3.0 Weather

Weather was recorded for 13:58 at Ryan Field Airport (RYN) in Tucson, Arizona, 20 NM northeast of the wreckage location. The temperature was reported as 88°F (31°C), the dew point was 32°F (0°C), and the barometric setting was 29.96 inHg. Skies were clear and visibility was ten statute miles. Winds were 11 kts from 200°.

4.0 Flight Path

The airplane took off from RYN at 13:39:10 (Figure 2). It flew southwest and climbed to about 4,600 ft mean sea level (msl) (Figure 3). Between 13:44 and 13:49 the airplane completed a series of turns at speeds between 90 and 110 kts calibrated airspeed. The airplane then climbed to above 6,600 ft and completed a series of circles at speeds between 90 and 110 kts calibrated airspeed.

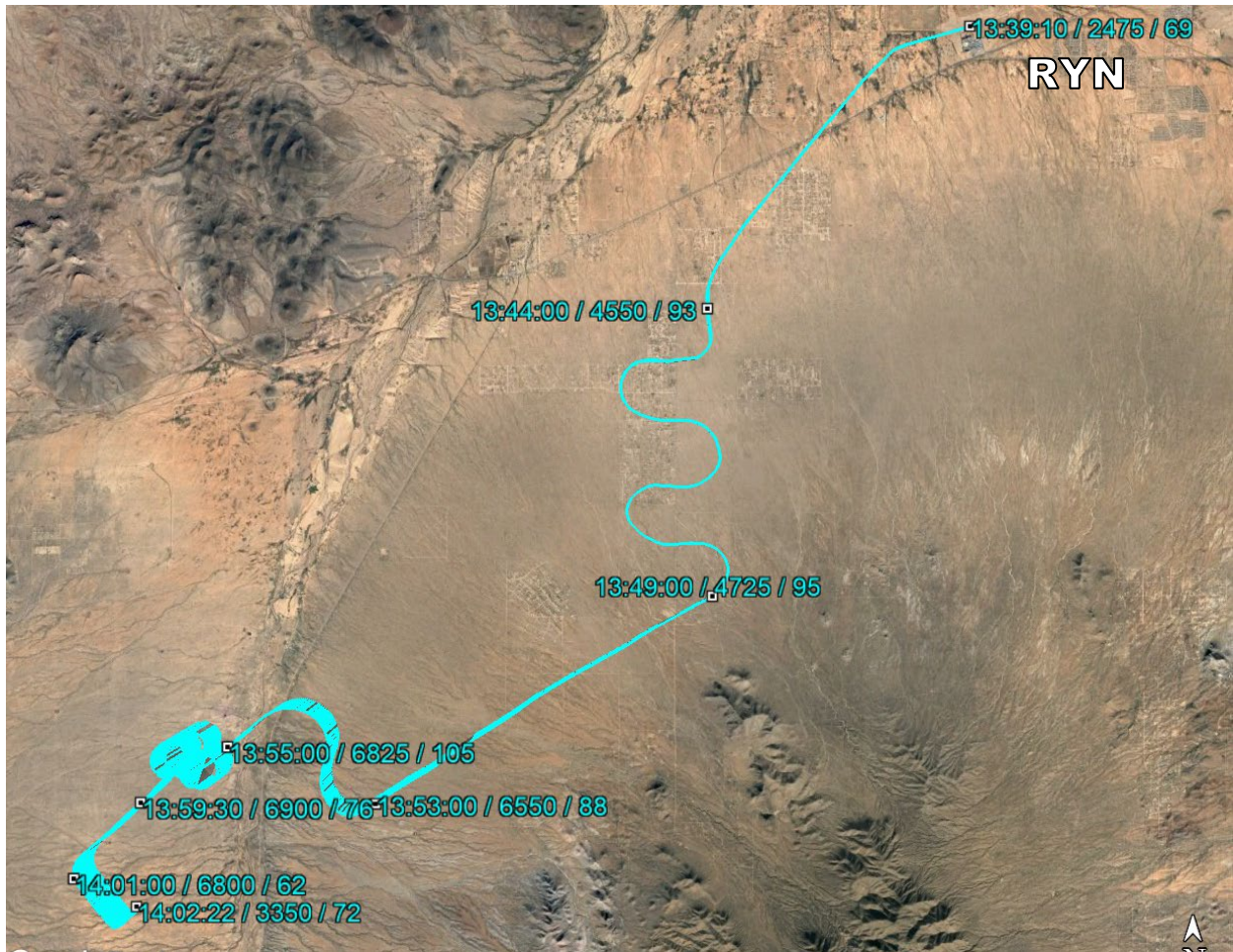


Figure 2. ADS-B flight path with selected times / altitude (msl) in ft / airspeed in kts annotated.

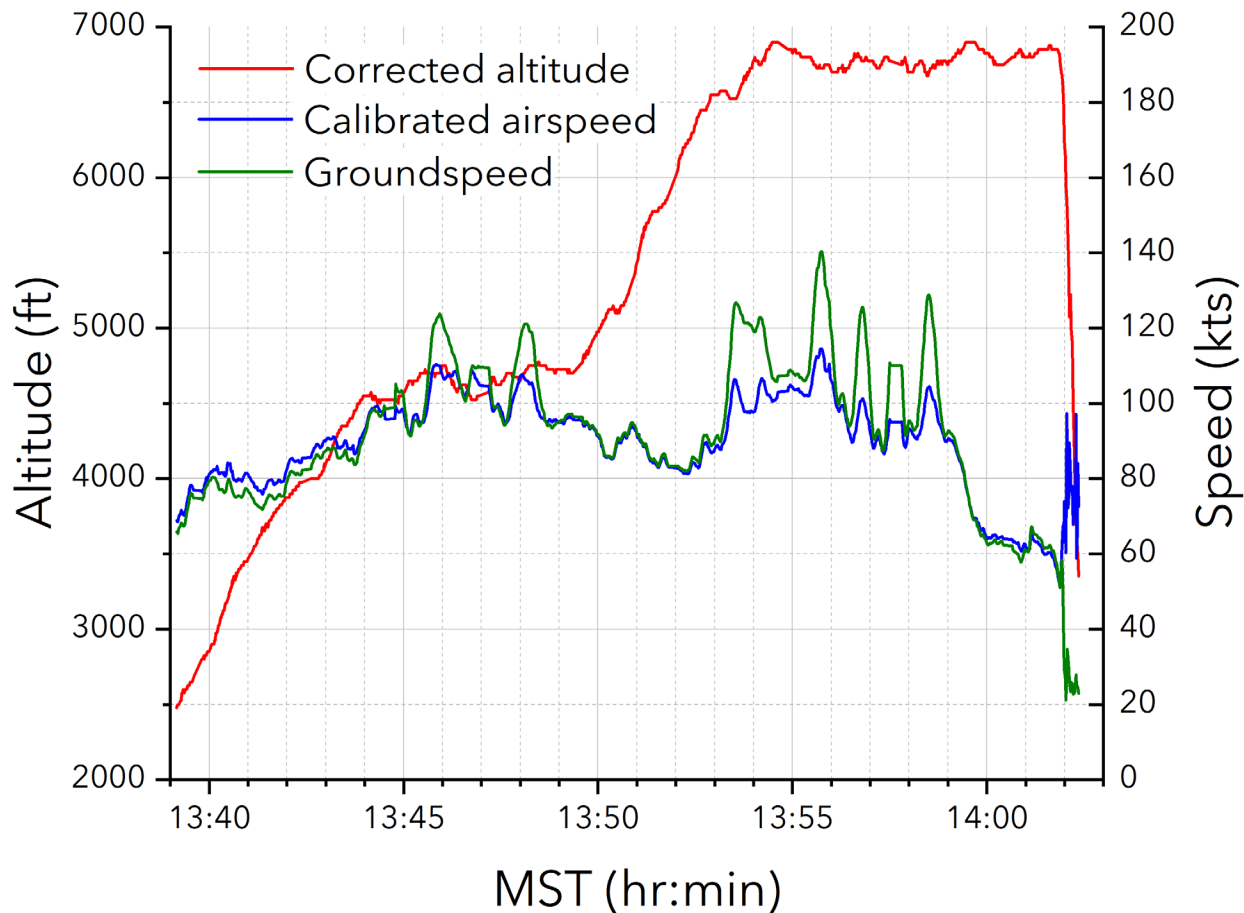


Figure 3. ADS-B altitude (msl) with calculated ground and airspeed.

After 13:59, the airplane slowed to just above 60 kts calibrated airspeed while maintaining an altitude above 6,600 ft. Figure 5 shows the airplane’s altitude and calculated groundspeed and airspeed for the end of flight. The Airplane Flight Manual [1] reported the wings-level, power-off stall speeds as 57 kts light and 61 kts heavy, calibrated airspeed. The airplane was flying only 4-7 kts above its reported stall speed during the final two minutes of flight.

Just after 14:01:50, the airplane’s calibrated airspeed slowed below 57 kts and the airplane began rapidly losing altitude. The airplane entered a tight left turn as it descended. Slowing below reported stall speed followed by a sudden loss of altitude, and tight turn is consistent with the airplane experiencing aerodynamic stall.

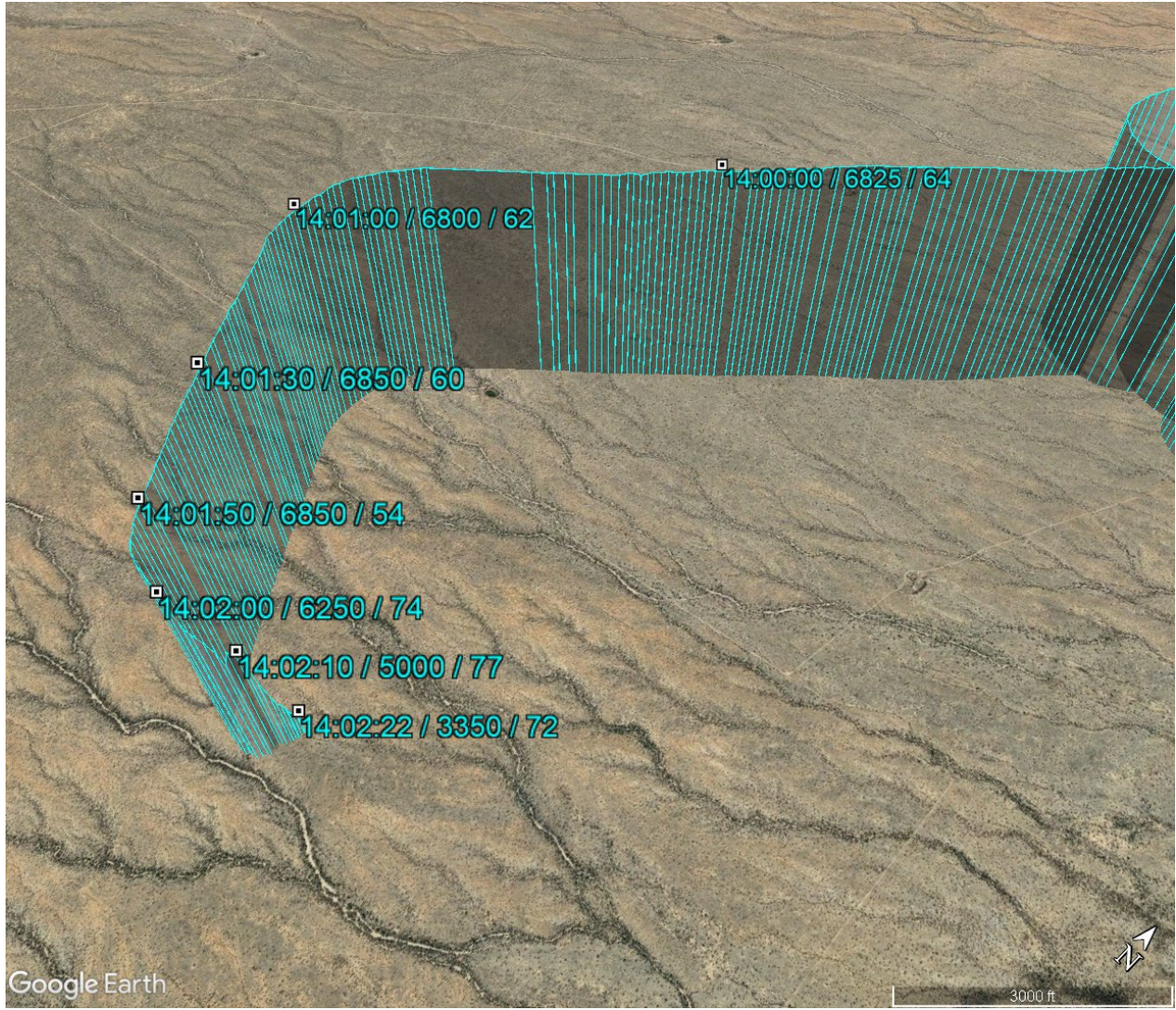


Figure 4. ADS-B flight path with selected times / altitude (msl) in ft / airspeed in kts annotated.

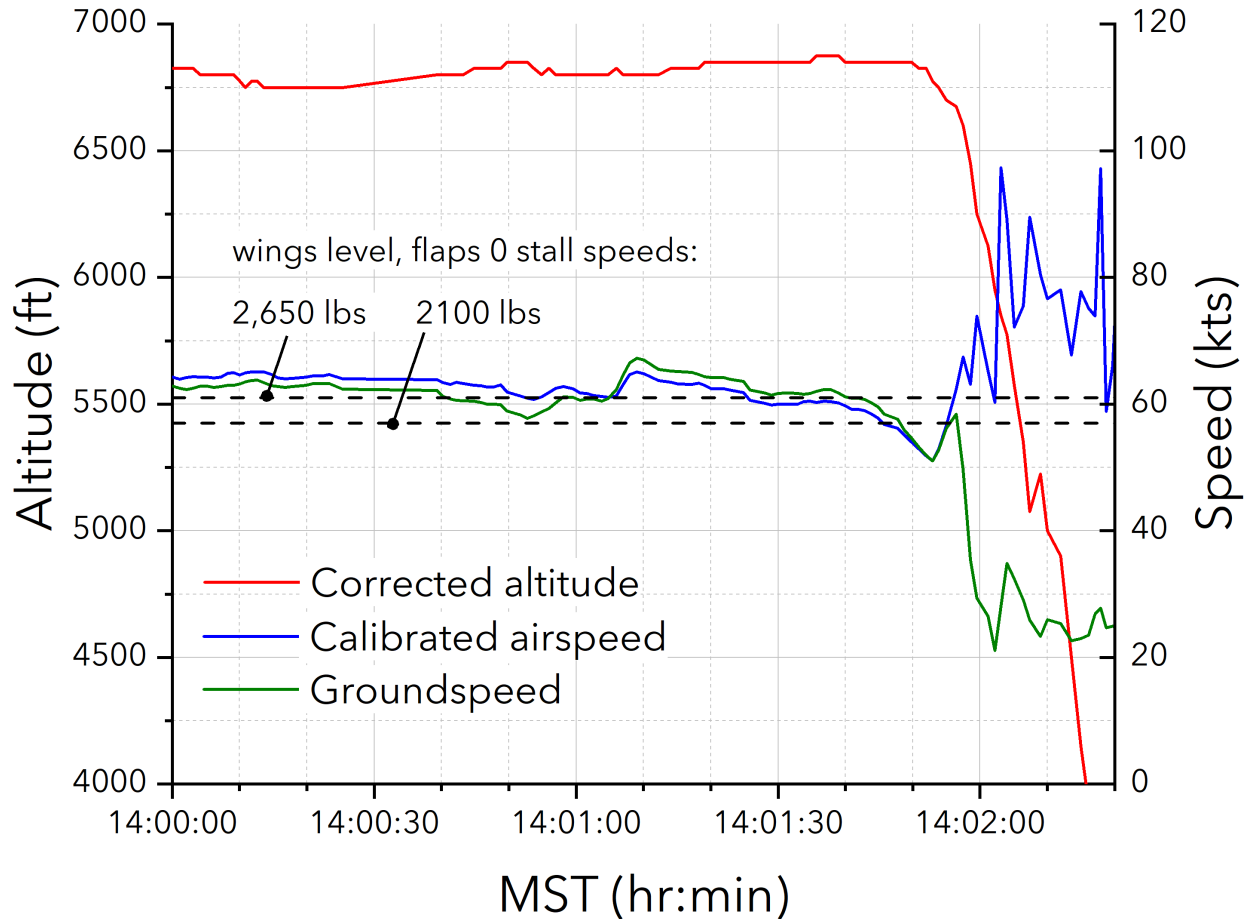


Figure 5. ADS-B altitude (msl) with calculated ground and airspeed.

D. SUMMARY

The airplane took off from RYN at 13:39:10 and completed several maneuvers. After 13:59, the airplane slowed to a calibrated airspeed very near its stall speed. After 14:01:50, the airplane's airspeed dropped below the reported stall speed, and it rapidly lost altitude while in a tight left turn. Slowing below reported stall speed followed by a sudden loss of altitude, and tight turn is consistent with the airplane experiencing aerodynamic stall.

E. REFERENCES

1. Airplane Flight Manual Model 112. Commander Aircraft Division, Rockwell International. 1974.