

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA22LA312

PERFORMANCE STUDY

Aircraft Performance Study

By

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A. ACCIDENT

Location: Russell, Pennsylvania
Date: July 14, 2022
Time: 1940 eastern daylight time (EDT)
Aircraft: Flightstar II-SC, N6116U

B. SUMMARY

On July 14, 2022, about 1940 eastern daylight time a Flightstar II-SC, N6116U, was substantially damaged when it was involved in an accident at Shield Farm Airport (5PA6), Russell, Pennsylvania. The non-certificated pilot was seriously injured, and the passenger sustained minor injuries. The aircraft was operated as a Title 14 *Code of Federal Regulations* (CFR) Part 91 personal flight.

C. PERFORMANCE STUDY

1.0 Aircraft

The Flightstar II-SC is a two-seat, high-wing, single engine kit aircraft. Its empty weight is 465 lbs; it has a maximum speed of 83 kts and a stall speed of 31 kts.



Figure 1. Exemplar Flightstar II-SC.

2.0 Available Data

The aircraft was equipped with a GoPro HD2-14, which in addition to video images recorded the Global Positioning System (GPS) time, latitude, longitude, and altitude of the aircraft. Data was recorded once a second from 19:37:55 to 19:38:36.

The video is evaluated in the Video Study [1] and recorded from 19:37:55 until 19:38:17.70. The last video frame showed the aircraft with tree branches in front of it and impact imminent.

3.0 Weather

Weather was recorded for 1953 at Bradford Regional Airport, 20 nautical miles (NM) south-east of the accident. The temperature was reported as 71°F (22°C), the dew point was 52°F (11°C), and the barometric setting was 30.14 inHg. Winds were 6 kts from 350°. Skies were clear and visibility was ten statute miles.

4.0 Flight Path

The aircraft was taking off from a grass field, seen in Figure 2. The altitude recorded by the onboard device was corrected by a constant offset to more accurately reflect the terrain elevation in the area. Figure 3 shows the estimated height above the ground of the wheels, calculated airspeed, and calculated groundspeed. The final points from 19:38:25 to 19:28:36 are not shown as the aircraft is no longer moving.

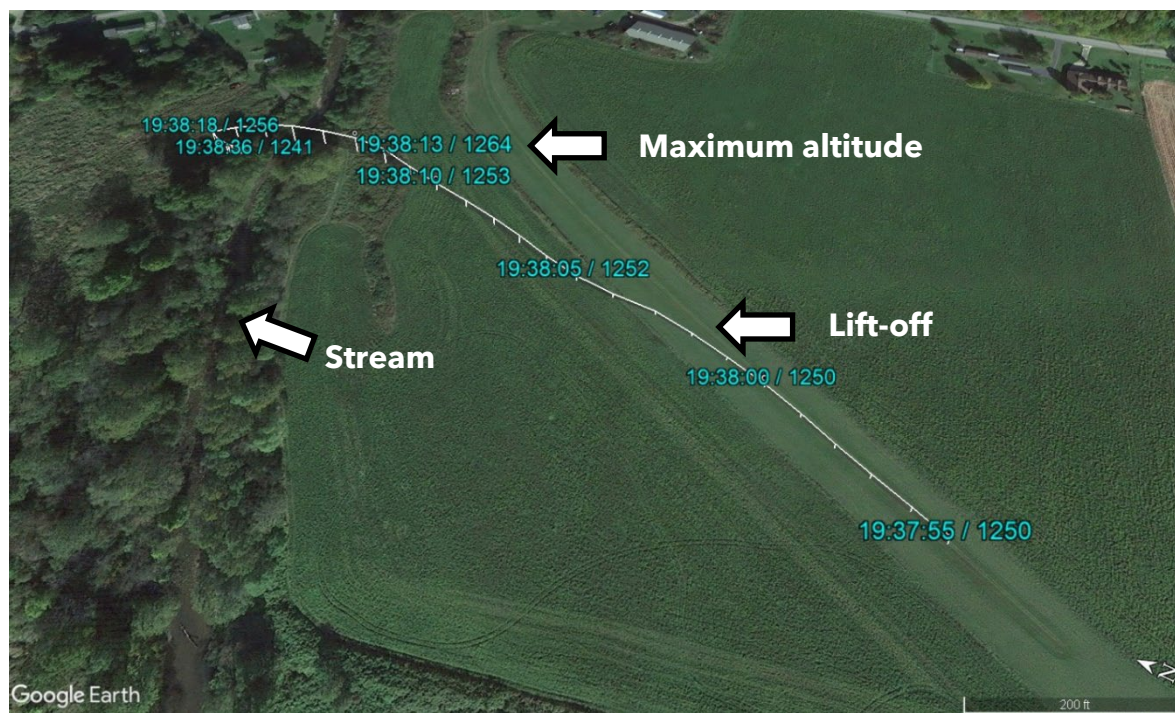


Figure 2. Aircraft flight path with selected times and altitudes above mean sea level (msl) annotated. Lift-off (19:38:02) and maximum altitude are noted in addition to the stream bed.

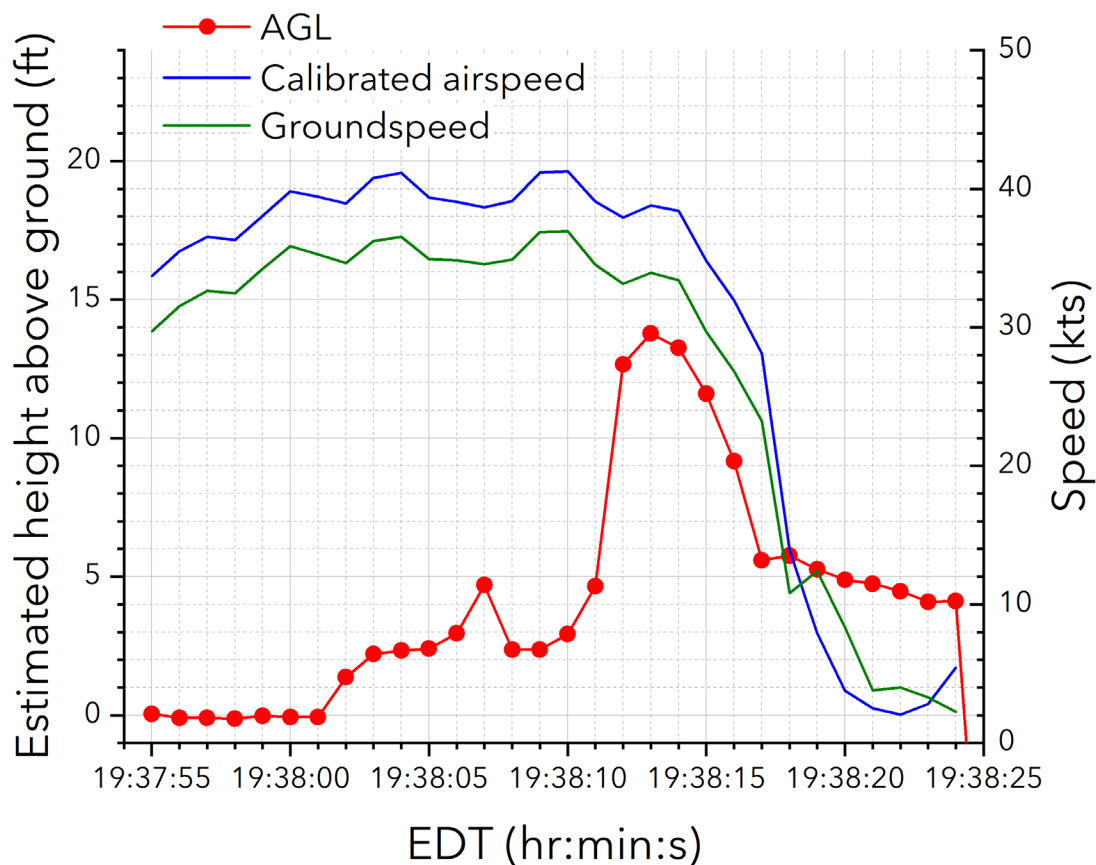


Figure 3. Aircraft altitude above ground level (AGL), calculated calibrated airspeed, and calculated groundspeed.

Calibrated airspeed was about 2.5 kts higher than the groundspeed, but was based on wind and atmospheric conditions recorded 20 NM away from the accident location. The aircraft accelerated down the runway along the centerline until 19:38:02 when the track began deviating to the left and the altitude increased slightly at an airspeed of about 40 kts. The aircraft tracked to the left while not gaining significant altitude and maintaining airspeed for another 5-7 seconds. The aircraft then gained 10 ft in about 3 seconds (200 ft/min climb rate).

The aircraft slowed and lost altitude. It descended and continued making a gradual left turn. At 19:38:18, as speed dropped below 20 kts, the aircraft's flight track made a sharp left turn (Figure 4). This is consistent with the video ending at 19:38:17.7 with tree branches in view. The aircraft then made a 180° turn and traveled another 70 ft while slowing to near zero.



Figure 4. End of flight times and altitudes for selected points.

The estimated stall speed for the aircraft is 31 kts¹. The aircraft's groundspeed dropped below 30 kts at 19:38:15 and the calibrated airspeed dropped below that level at 19:38:17 as it was descending. Assuming the winds were accurate, the aircraft was at risk of aerodynamic stall after approximately 19:38:17, possibly earlier with different winds. The loss of altitude and airspeed at 19:38:14 was consistent with stall.

The passenger who was seated in the right seat stated, "We tried to make it over the trees, and we hit a tree. It didn't climb like it normally does." The Video Study did not find evidence of a loss of power.

D. SUMMARY

The aircraft's calculated airspeed was not more than 42 kts and it gained less than 15 ft of altitude during the flight. After liftoff, it drifted to the left of centerline, which continued as the aircraft climbed. About 11 seconds after lift-off, the aircraft

¹ The manufacturer of the Flightstar II-C kit is no longer in business and an official manual could not be located. Various other references reported a stall speed of 36 mph/31 kts.

started to descend and slow while turning left over a stream. The aircraft slowed below the aerodynamic stall speed and descended through the trees to the ground.

E. REFERENCES

1. Video Study, ERA22LA312, National Transportation Safety Board.