

National Transportation Safety Board

Office of Research and Engineering

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CEN22FA216

VEHICLE PERFORMANCE

7/13/2022
Timothy Burtch

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A. ACCIDENT

Location: Cheyenne, Wyoming
Date: May 30, 2022
Time: 0748 MDT
1348 GMT
Airplane: Express 2000 RG, N44508

B. VEHICLE PERFORMANCE

No airplane performance group was formed.

C. SUMMARY

On May 30, 2022, about 0748 mountain daylight time (MDT), an Express 2000RG airplane, N44508, was destroyed when it was involved in an accident near Cheyenne, Wyoming. The pilot was fatally injured. The airplane was operated under the provisions of Title 14 Code of Federal Regulations Part 91 as a personal flight.

The airplane departed Cheyenne Regional Airport/Jerry Olson Field (CYS) from runway 27, about 0744, with the intention of flying to Texas. Shortly after takeoff, the pilot declared an emergency with air traffic control (ATC) tower personnel and informed them that he had “an engine failure” and was about four miles south of the airport. He later reported that he would not be able to land at the airport and intended to land in a field. He also stated that he was “on fire” and asked ATC to send fire rescue. Video cameras from a local business captured a portion of the accident sequence which showed the airplane descending, near vertical, with a right roll. See Figure 1.

The airplane collided with a storage facility. The initial impact point was a divot in the concrete. The wreckage path continued about 15 ft into a storage locker. A post-crash fire ensued which consumed a majority of the airplane.

Times in the study are quoted in MDT. Greenwich Mean Time (GMT) = MDT + 6 hr.

D. THE AIRPLANE

A picture of the accident airplane, an Express Aircraft Incorporated Express 2000 RG, is shown in Figure 2. The kit airplane was built by JG Burr in 2008 and is registered to Aeromania, LLC.

E. WEATHER SUMMARY

A routine weather observation for Cheyenne Regional Airport about five minutes after the accident was reported as:

METAR KCYS 301353Z 30017G28KT 10SM CLR 09/M01 A2960 RMK AO2 PK WND 30028

The automated surface weather observation at Cheyenne Regional Airport on May 30 at 0753 CDT is wind from 300° at 17 knots (kt), gusts to 28 kt; 10 statute miles visibility; clear skies; temperature 9° Celsius (C); dew point -1°C; altimeter 29.60" of mercury; peak wind from 300° at 28 kt.

F. AIRPLANE PERFORMANCE STUDY

The airplane performance study is largely based on Automatic Dependent Surveillance-Broadcast (ADS-B) data provided by the Federal Aviation Administration (FAA). ADS-B is a primary technology supporting the FAA's Next Generation Air Traffic Control System, or NextGen, which is shifting airplane separation and air traffic control from ground-based radar to satellite-derived positions. ADS-B broadcasts an airplane's Global Positioning System (GPS) position to the ground where it is displayed to Air Traffic Control (ATC). The GPS position is also transmitted to other airplanes with ADS-B receivers, either directly or relayed through ground stations, to allow self-separation and to increase situational awareness.

GPS has an accuracy of approximately 20 meters in both the horizontal and vertical dimensions. GPS augmented with the Wide Area Augmentation System (WAAS) is accurate to approximately 1.5 – 2 meters.

Figures 3 shows the ADS-B altitude and estimated airspeed for the four-minute flight in an overhead view. Figure 4 shows the same parameters as well as the estimated rate-of-climb (ROC) in a time history format.

Figures 5 includes the airplane attitude information estimated from ADS-B data. Worth noting are the two 75° bank turns: the first to the left at 0746:42 and the second to the right at 0748:02. During the first turn the pitch attitude of the airplane was reduced from 10° to almost -10°. This would result in a reduction in airplane angle-of-attack. During the second turn to the right, the airplane's pitch attitude was increased from approximately zero to almost 11°. This would result in an increase in airplane angle-of-attack. Estimated angle-of-attack, as well as longitudinal and normal load factors, are shown in Figure 6.

G. SUMMARY AND CONCLUSIONS

The pilot of N44508 reported an engine failure shortly after take-off and that he needed to return to the airport. Shortly after, the pilot reported to the tower that he was not going to be able to reach the airport and that he intended to land in a field. He also indicated that there was a fire.

Airspeed and airplane attitude information estimated from ADS-B data provided by the FAA show that bank angles exceeding 75° were used to maneuver the airplane back towards the airport. In the final 75°-banked turn to the right, estimated angle-of-attack, rate-of-climb, and normal load factor data indicate that the airplane likely experienced an accelerated stall while less than 400 ft above the ground. The airplane impacted a storage facility seconds later.

Submitted by:

Timothy Burtch
Specialist - Airplane Performance
National Transportation Safety Board

H. FIGURES



Figure 1: The Four Minute Flight Departed Cheyenne Regional Airport with Texas as the Intended Destination



Figure 2: Accident Airplane, N44508, a 2008 JG Burr Express 2000 RG

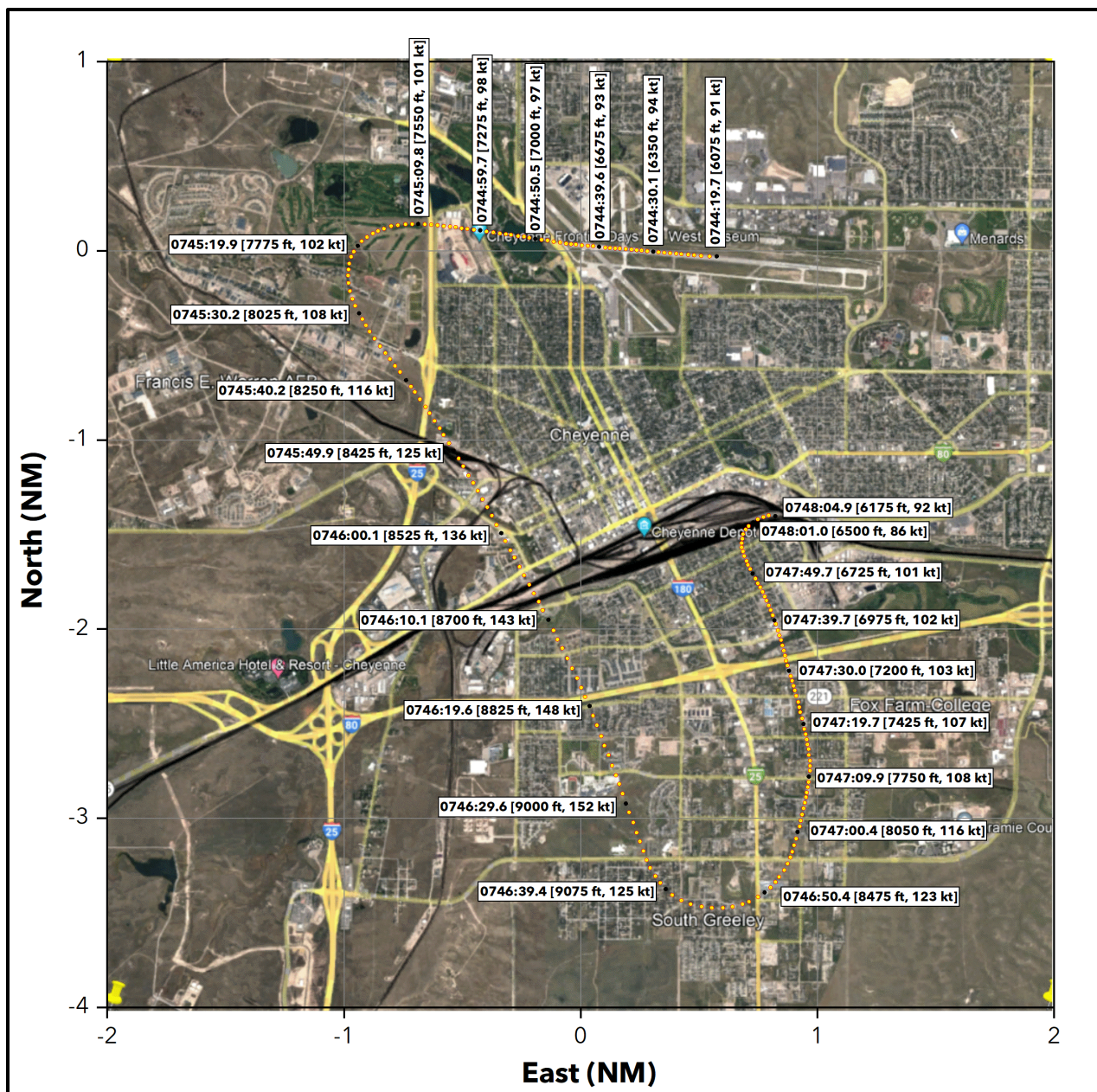


Figure 3: ADS-B Altitude and Estimated Airspeed for the Accident Flight

CEN22FA216: Express 2000 RG, N44508
Cheyenne, WY
5/30/2022

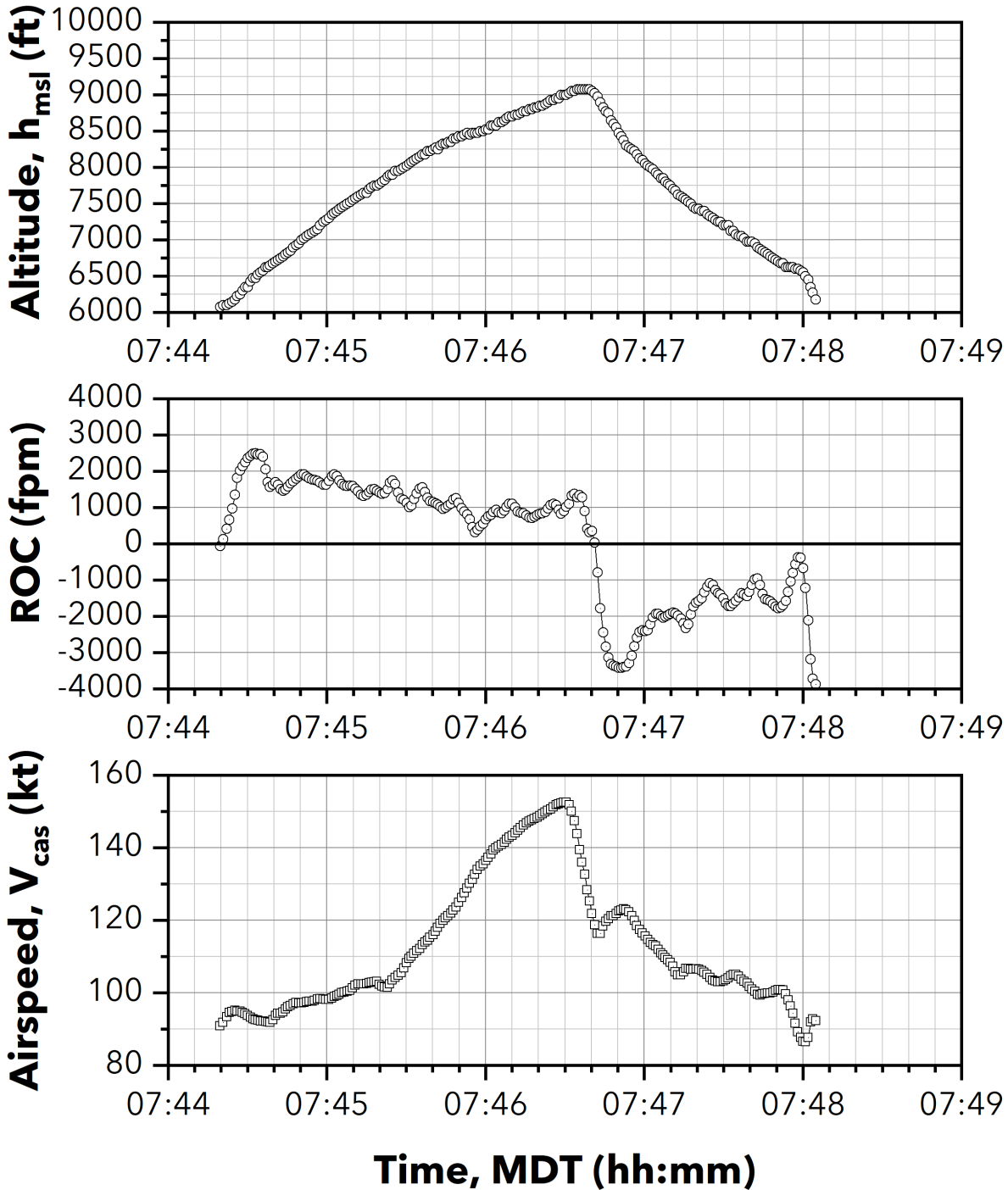


Figure 4: ADS-B Altitude, ROC, and Estimated Airspeed for Accident Flight

CEN22FA216: Express 2000 RG, N44508
Cheyenne, WY
5/30/2022

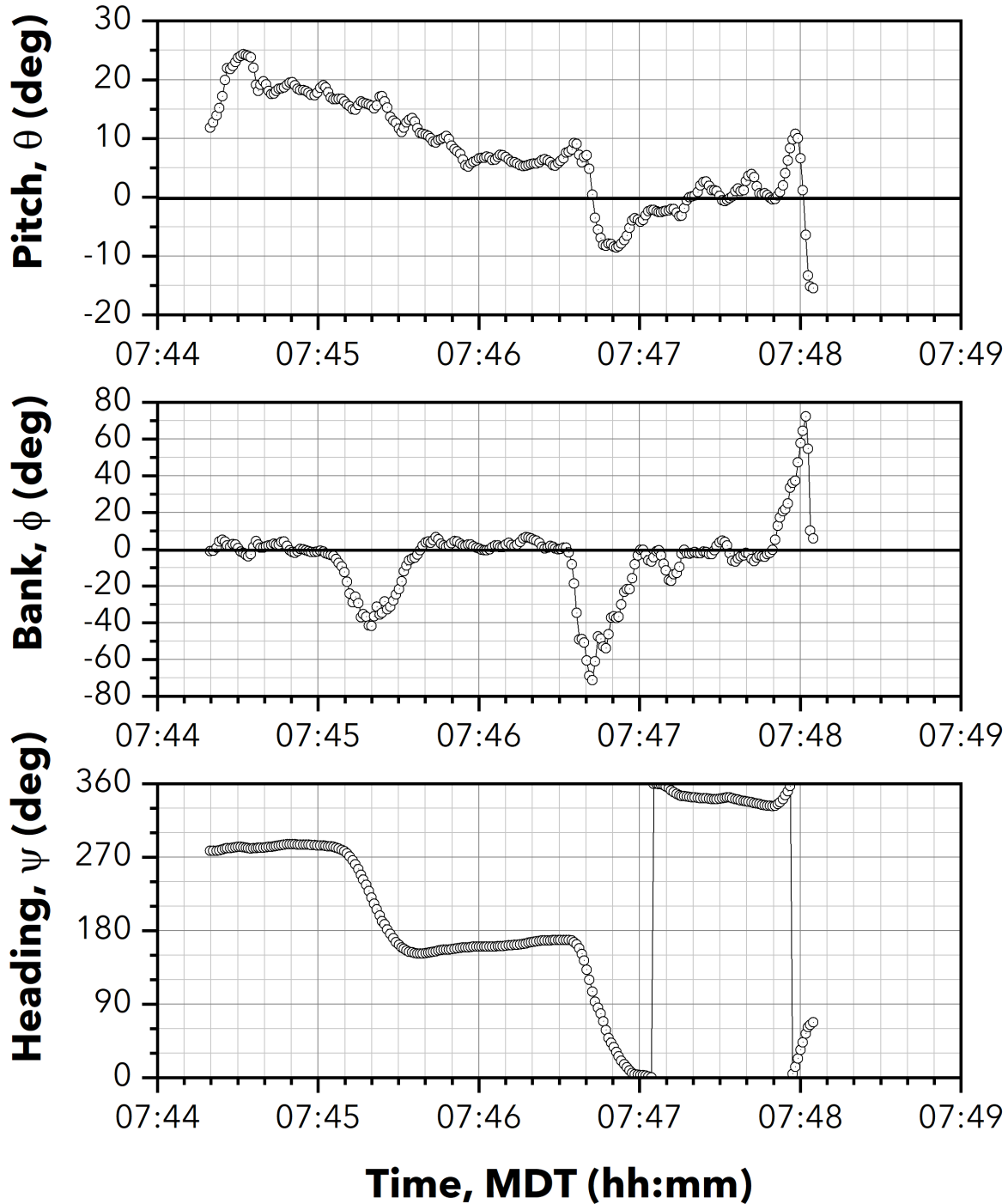


Figure 5: Estimated Pitch, Bank, and Heading Angles for Accident Flight

CEN22FA216: Express 2000 RG, N44508
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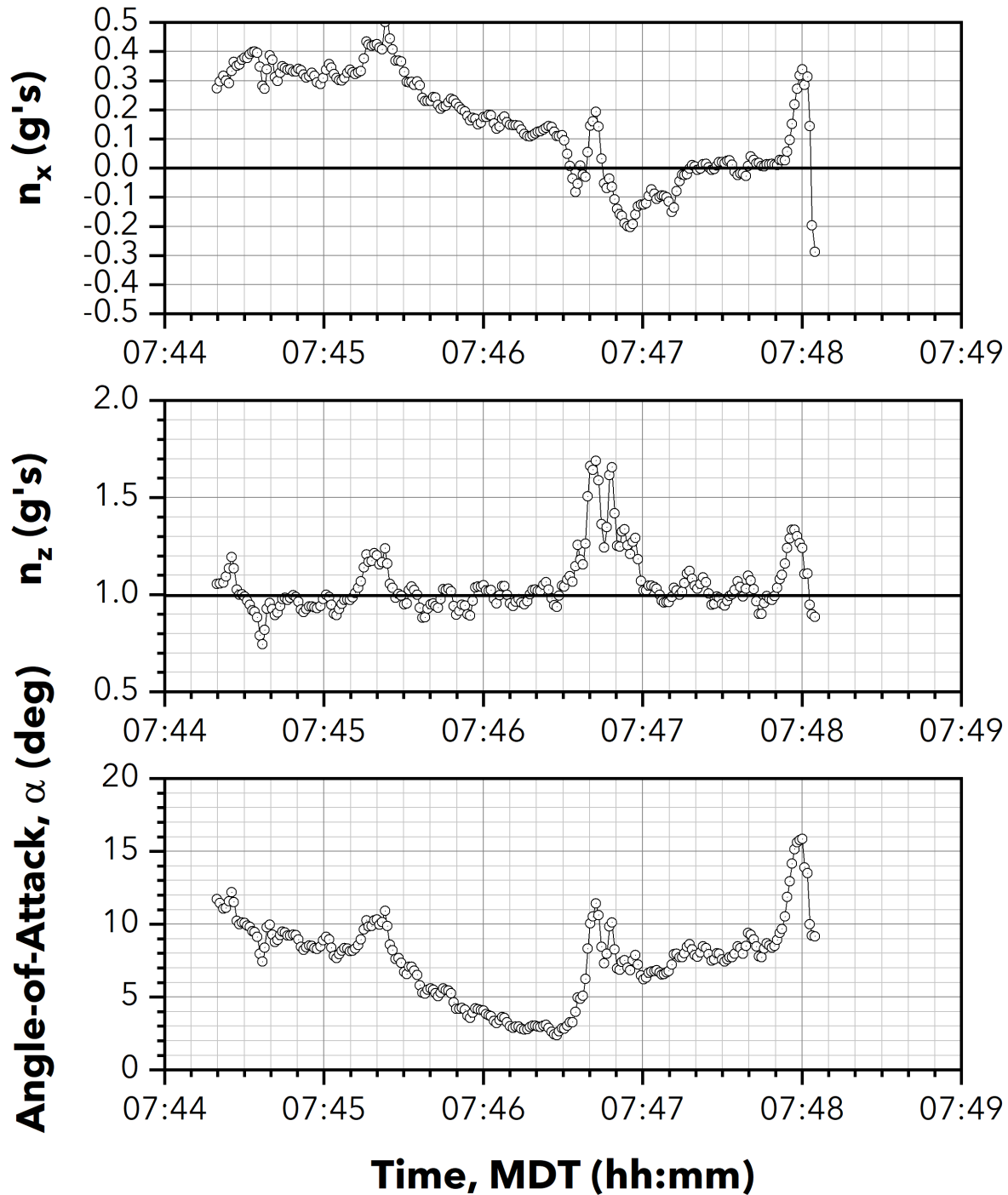


Figure 6: Estimated Longitudinal / Normal Load Factors and Angle-of-Attack for Accident Flight