NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, D.C. 20594

Structures Group Chairman's Factual Report

December 17, 2019

A. ACCIDENT CEN19MA190

Location:	Addison Airport, Addison Texas
Date:	June 30, 2019
Time:	0911 central daylight time
Aircraft:	Textron Aviation B300, registration N534FF

B. GROUP

Chairman:	Tom Jacky National Transportation Safety Board Washington, D.C.
Member:	Jennifer Barclay Textron Aviation Wichita, Kansas
Member:	Andrew Hall Textron Aviation Wichita, Kansas

C. SUMMARY

On June 30, 2019, about 0911 central daylight time, a Textron Aviation B300, N534FF, was destroyed when it was involved in an accident near Addison, Texas. The airline transport pilot, the commercial co-pilot, and eight passengers sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The group met at the accident site from July 1, 2019 to July 3, 2019. The group identified and documented the recovered airplane structure.

The four corners of the airplane structure were located at the accident site. No evidence of a pre-impact structural failure was noted during the investigation.

All pertinent documentation and photographs were provided to each of the parties. At the conclusion of the on-scene investigation, the recovered airplane wreckage was moved to a secured storage facility in Lancaster, Texas.

D. DETAILS OF INVESTIGATION

The group met at the accident site to document the airplane structure prior to its removal. The airplane was documented at the accident site in the following manner:

1.0 Aircraft Description

The airplane's data plate indicated as follows:

Airplane Serial Number: FL-1091
Airplane Manufacturer: Textron Aviation, Inc.
Airplane Model: B300
Airworthiness Certificate: A24CE

In addition, the airplane's registration number was indicated as N534FF.

The airplane's dimensions were noted in Figure 1:

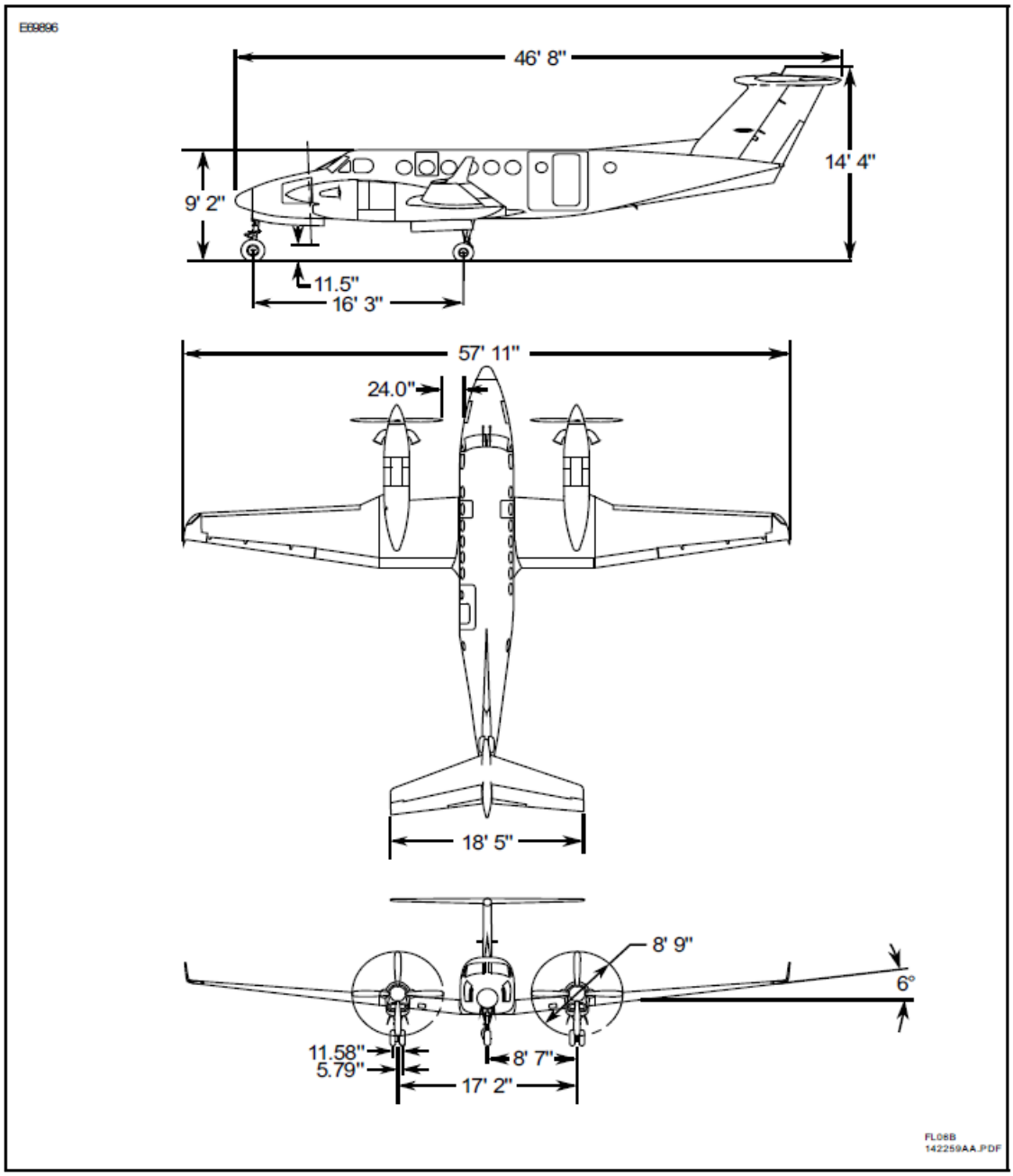

Figure 1 - Three View Drawing of Airplane's Dimensions

2.0 Accident Site and Wreckage Distribution

The airplane impacted the Sky B & B hangar located on the airport. At the accident site, airplane wreckage was recovered from the following locations:

- A (east/west) hangar wall at the first impact point (Figures 2 and 3)

Figure 2 - Side of hangar with initial impact site (at top of wall).

Figure 3 - Close up detail of initial impact location.

- The lower roof of the hangar, below the initial impact location (Figure 4)

Figure 4 - Lower roof area with airplane debris.

- On the airport ramp, immediately outside the hangar and lower roof (Figures 5 and 6)

Figure 5 - Ramp area outside hangar, with airplane debris.

Figure 6 - Example of airplane debris (propeller blade) found on ramp.

- Inside the hangar (Figure 7 and 8)

Figure 7 - Airplane and hangar debris located inside hangar.

Figure 8 - Inside the hangar, looking at the roll-up door.

- Behind the hangar. After impacting the hangar roof, the airplane impacted the floor and traveled across the hangar, went through a 14’ x 14’ roll-up door, and came to rest against an outer wall of the offices attached to the hangar. The lower half of the roller door was separated from the door by the impact. (See Figure 9)

Figure 9 - Wreckage location outside the hangar.

For more information regarding the damage to the hangar, please refer to the UAS Aerial Imagery Factual Report.

3.0 Fire Damage

The airplane was destroyed by impact and post-crash fire. Examination of the wreckage indicated evidence of a post-crash fire and no evidence of an in-flight fire before the impact with the hangar.

The post-crash fire consumed portions of the airplane’s structure: the airplane pieces that were recovered at the location outside the hangar (having gone through the hangar and out the rear) and the pieces recovered near the rear hangar (roll up) door, inside the hangar.

The portions of the airplane that were not damaged by fire separated from the airplane during the initial impact and landed on the tarmac or inside the hangar, away from the roll-up door.

4.0 Structure

4.1 Fuselage

Most of the identified fuselage was located behind the hangar. Fuselage components identified inside the hangar included the radome and the tail cone structure, which was found attached to the large section of the empennage.

The largest section of fuselage wreckage was located behind the hangar, against an exterior wall. The segment extended from Fuselage Station (FS) 30 to Cantilevered Fuselage Station (CANT STA) 435. The piece covered sections of the left and right wing. Most of the fuselage structure was consumed by fire; most of the remaining identified fuselage was from the right side, with about 50% remaining. The right upper cabin was identified by light fixtures and passenger seat light fixtures, near the top fuselage centerline.

The belly portion of fuselage was mostly consumed by fire; approximately 20% of the aft belly portion of the fuselage was noted. Also, portions of the aft pressure bulkhead were noted on the aft end of the fuselage wreckage.

The forward fuselage area, from FS 30 to FS 100 received impact and fire damage. The windshield and overhead cabin were intact aft to FS 147, with sooting and fire damage in the area. Portions of the left side and belly were consumed by fire. The nose landing gear bay area exhibited scorching and sooting. See Figure 10.

Figure 10 - Forward fuselage

The RH pitot tube was still attached to the forward fuselage, the LH pitot tube was found in the loose wreckage.

4.2.0 Stabilizers

The horizontal and vertical stabilizers were located together in one piece of wreckage, separated from the fuselage. The segment of wreckage was found on the hangar floor, beneath the initial impact point of the airplane with the hangar (Figures 11 and 12). The segment was damaged by fire.

Figure 11 - Horizontal and Vertical Stabilizers, as found.

Figure 12 - Vertical Stabilizer and underside of horizontal stabilizer, in hangar.

The horizontal stabilizers were still connected to the vertical stabilizer. Also connected to the vertical stabilizer was the aft fuselage and tail cone, from CANT FS 435 to CANT FS 471. The fuselage structure below the stabilizer was crushed up to the vertical stabilizer.

4.2.1 Vertical Stabilizer

The rudder control surface and rudder trim tab were found attached to the vertical stabilizer.

Scorching and sooting of the vertical stabilizer was noted over both sides of the surface. The rudder exhibited similar scorching and sooting with some melting of the rudder skin too.

The vertical stab is creased with diagonal displacement from CANT FS 435 running up and aft to CANT FS 471.

4.2.2 Right Horizontal Stabilizer

The RH elevator was displaced down at STAB ST 74 and outboard, about 10° down. Scorching and sooting were prevalent along top of elevator, mostly with the 75% outboard segment.

The elevator control surface, trim tab, and balance weight were still attached.

The bottom of the elevator exhibited more heat damage than the top surface.

The tip of the elevator was curled down.

A buckle was noted on the bottom of the elevator, starting at Stab Station (SS) 90 at the leading edge, running diagonally inboard (INBD) and aft to about SS 74. Other areas of generalized wrinkling were noted on the bottom of the stabilizer surface.

4.2.3 Left Horizontal Stabilizer

The left horizontal stabilizer was displaced about 15° downwards at SS 58.

The left elevator, trim tab, and balance weight were found attached but damaged by fire. The stabilizer was scorched along the length of the top and bottom of the elevator.

The left elevator was buckled, from SS 12 to SS 58 on the bottom of the elevator.

4.3 Wings

The wings were separated from the fuselage and broken into several sections. After the pieces of wing were recovered, the group gathered and arranged them on the hangar floor in their relative positions. Each piece was labeled alphabetically, from right wingtip to left wingtip. The pieces of wing were noted as follows:

- Piece A – Right Wing Outboard

This section of right wing, from wing tip inboard to Wing Station (WS) 328, was recovered from the lower roof of the hangar. This segment may have been broken off from the next piece during recovery. The section sustained fire damage and the fuel cell was compromised. The composite portion of the wing tip was fire damaged and was flexible, exhibiting a loss of structural strength (Figure 13).

Figure 13 - Outer Right Wing and Wingtip, on lower roof. (Pieces A and B)

- Piece B – Right Wing Outboard

The piece was recovered from the lower roof of the hangar. Section of the outboard portion of the wing from WS 320 to WS 194. The piece was melted and damaged by fire; the leading-edge section of the wing was consumed by fire. The upper forward spar extended past the section to WS 176. See Figure 13.

The center section of the wing showed extensive heat and fire damage. The aileron also showed fire/heat damage.

- Piece C – Right Wing Outboard

The piece of wreckage was recovered from the hangar wall – the segment was wrapped around a vertical structural member of the hangar wall. The leading edge of the wing segment was "wrapped" about the vertical structural member at about WS 159. The piece extended from WS 194 (the intersection of the aileron and outboard flap) to WS 124 (the outboard end of the nacelle). See Figure 14.

Figure 14 - Section of right wing found in hangar wall at initial impact point (Piece C).

The inner spar portion of the piece was mostly consumed by fire. The leading-edge section and trailing edge (TE) flap sections were damaged by heat.

- Piece D – Right Wing Inboard

The piece was inboard of nacelle into the center wing section. The piece was found underneath the main fuselage behind the hangar, against the outer hangar wall. The segment extended from WS 124/122 (at the bathtub fitting) to WS 25 (or Buttock Line {BL} 25). A portion of the right main landing gear was noted in the segment, but the gear was noted displaced inboard. See Figure 15.

Figure 15 - Right hand wing Piece D, moved from found location outside the hangar.

The segment exhibited fire/heat damage. The lower main spar cap extended into BL 0 and was partially consumed by fire. The upper main spar appeared to extend to the cabin line at the tip at approximately BL 25.

- Piece E – Left Wing Inboard

The piece was laid upside down, as it was located and identified upside down, behind the hangar, partially underneath the main fuselage. The piece was damaged by fire and heat and mostly consumed. The piece extended from BL 25 to WS 194, where the outboard flap meets the aileron. The flap was mostly consumed by fire. Some rear spar was noted in the area near the main landing gear. Most of the lower wing consumed by fire. The leading edge was only identifiable in a short segment. See Figure 16.

Figure 16 - Portion of Left Wing (Piece E) found with main wreckage.

- Piece F – Outboard Left Wing

The piece was estimated in length from WS 194 to WS 296 and was found inside the hangar, near the nose of another airplane parked in the hangar. The piece was crushed and sooted, but little fire damage was noted. See Figure 17.

Figure 17 - Portion of Left Wing (Piece F), as found in the hangar, below the initial impact point.

The aileron was attached to the inner spar section at the inboard hinge point. The aileron showed impact damage out to WS 296, the entire aileron was noted but crushed.

The center section was mostly intact but exhibited some fire damage.

- Piece G – Outboard Left Wing

The piece was from WS 296 to the wing tip. The piece was recovered from the ramp area outside the hangar. The leading edge was bent upward and aft at about WS 328. The inner spar section at WS 294, the trailing edge was folded forward and outboard. See Figure 18.

Figure 18 - Left wing tip section (Piece G), found outside hangar on the ramp area.

The wingtip light assembly was missing from the wreckage piece, but the light assembly was noted elsewhere in the wreckage. The wingtip was scorched but some paint was still visible.

4.4 Doors

The aft cabin door was located in the wreckage. There was no evidence that the door was opened. See Figure 19.

Figure 19 - Cabin Door

The airplane was equipped with two emergency exit doors, one on each side of the cabin. One door was located in the wreckage, inside the hangar office door hallway, next to the main fuselage wreckage site. See Figure 20. The exit was too damaged by fire and impact forces to determine whether the hatch had been opened. The other door was not identified in the wreckage.

Figure 20 - Emergency Exit Hatch

4.5 Nacelles

Both engine nacelles were in the wreckage, including the Raisbeck compartments located at the rear of the nacelles.

Tom Jacky
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