

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

UAS Aerial Imagery Report

05/27/2020

A. ACCIDENT DCA20FA059

Location: Calabasas, CA
Date: January 26, 2020
Time: 0945 Pacific Standard Time (PST)
Event: N72EX; Sikorsky S-76B

B. PERSONNEL

UAS RPIC: Aaron Sauer
 NTSB UAS Pilot
 Denver, CO
UAS VO: Josh Lindberg
 NTSB UAS Pilot
 Dallas, TX
IIC/UAS RPIC Bill English
 Washington DC

C. ACCIDENT SUMMARY

On January 26, 2020, about 0945 PST, a Sikorsky S76-B helicopter, N72EX, was destroyed when it was involved in an accident near Calabasas, California. The pilot and eight passengers were fatally injured. The helicopter was operated as a Title 14 Code of Federal Regulations Part 135 charter flight.

D. DETAILS OF IMAGERY

1.0 Equipment and Procedures

Equipment

Flights to photo-document and map the area of the crash were conducted on January 27 and 28, 2020, using two of the NTSB DJI Phantom 4 Advanced small unmanned aircraft systems (sUAS, or drone) and a DJI Mavic 2 Professional. The drones were equipped with dual GPS/GLONASS receivers which provide geo-reference information on all imagery. The Phantom drones are equipped with an FC6310 camera using the Sony Exmor 1” CMOS sensor, with a focal length of 8.8 mm. The Mavic drone was equipped with an L1D-20C camera using the Hasselblad 1” CMOS sensor, with a focal length of

10.26 mm. Still photo resolution of each camera was 20 megapixels in JPG or RAW format, and video resolution of 4K HD up to 120 frames per second.

Ground control points (GCP) and locations of select wreckage were taken with a Trimble GEO7X differential GPS receiver in the wreckage area.

Procedures

The accident site encompassed hilly, canyon terrain with various hiking/biking trails. Vegetation included short grasses and scrub trees. The wreckage area was in Class G airspace. There were no significant terrain, environmental, or obstruction hazards. The flights were conducted under 14 CFR 107 with Special Government Interest airspace approval due to a Temporary Flight Restriction. Weather conditions were VFR.

On January 27 and 28, the drones were flown in a nadir single grid pattern at 100 feet over the main wreckage site to build a quick overview map (see Processing section). Multiple double grid flights were conducted at 100 feet covering the entire area from initial impact to the farthest portion of the wreckage to create a 3D point cloud and detailed orthomosaic map. Video along the flight and wreckage path was taken using ADS-B position data obtained from the ATC group. A panoramic photo showing the vicinity of the accident site was taken in clear conditions.

Total mission time including set-up, gathering ground control points, flights, and initial processing was 20 hours over the 2-day period. Full resolution processing ran overnight on the evenings of January 27 and 28.

Processing

Over 900 high resolution photos and videos were gathered. A full resolution 3D point cloud and orthomosaic map were created using Pix4D photogrammetry software. The relative accuracy (measurements within the map) was calculated at 1.08 inches (2x ground sample distance). The GCPs were processed using the Abdalla Hall ULL Continuously Operating Reference Station (TONY), and resulted in a positional (absolute) accuracy of +/- 5cm (2 inches). Select photos, video, geotiff orthomosaic, and a Google Earth kmz orthomosaic are included and attached herein.

2.0 Imagery products

Figure 1 is an overall view photo, and Figures 2 and 3 are segments of the impact area and wreckage path. Significant points and directions, determined from the orthomap, are indicated on the photos. Figure 4 is a snapshot from the flight path video. Figure 5 is a sample of the panoramic photo (best viewed using pano viewer software using the file in the docket for this report.)

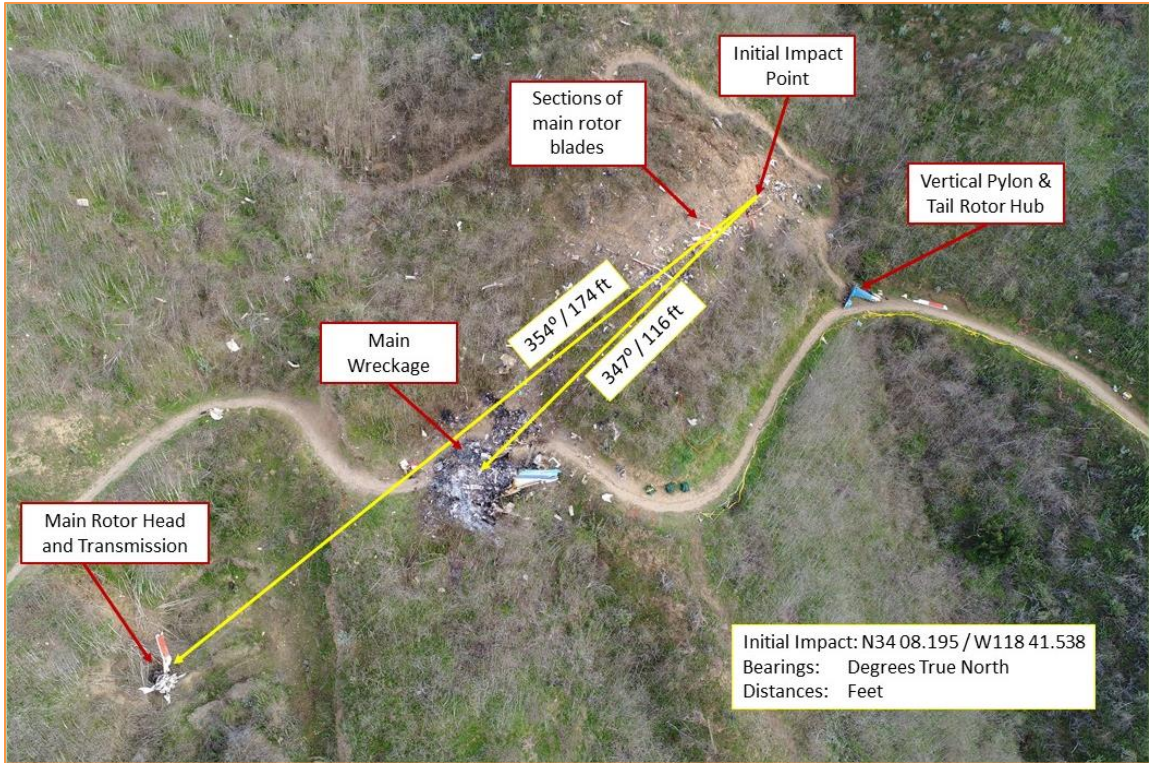


Figure 1. Overall view of initial impact area and wreckage path with select measurements and significant items.

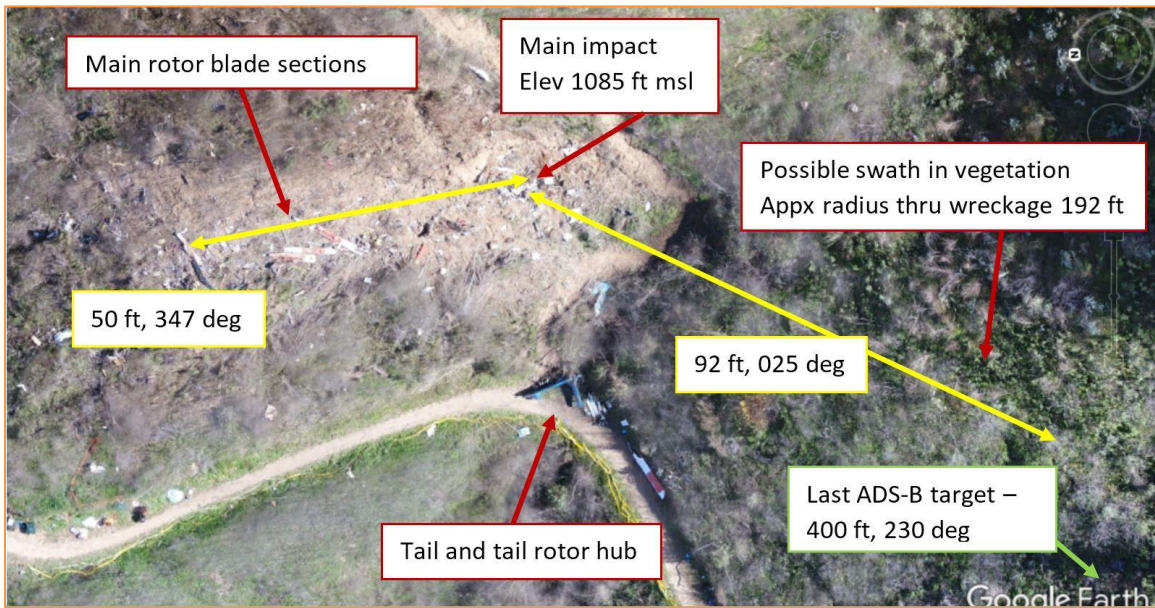


Figure 2. Overhead view of southern section of initial impact area and wreckage path.

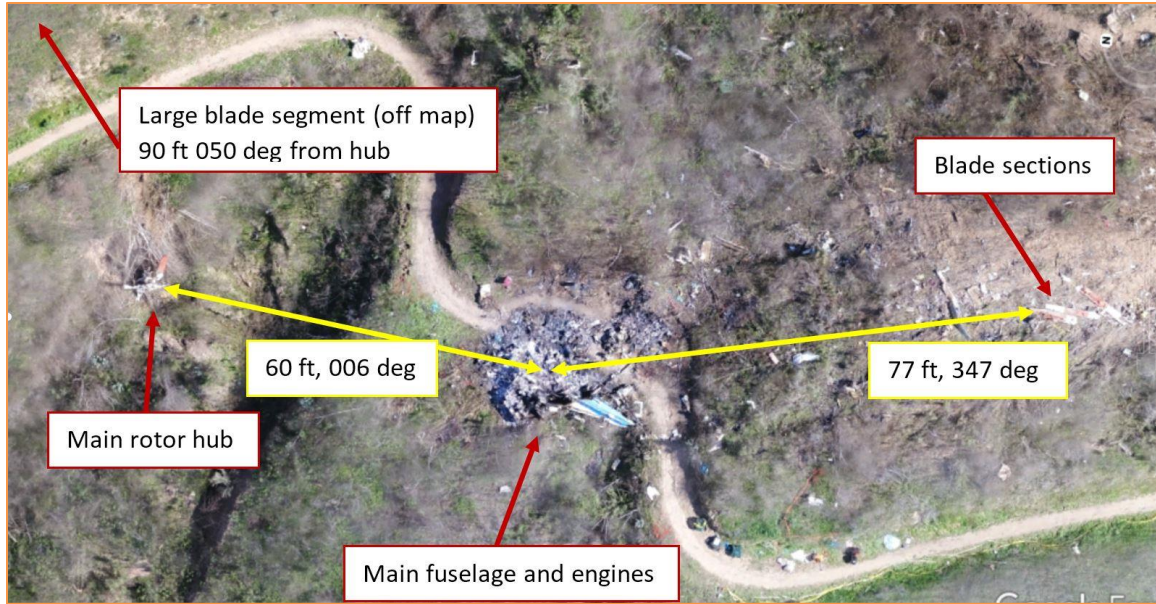


Figure 3. Overhead view of northern segment of wreckage path.



Figure 4. Snapshot from video looking along final flight path, from position of second-to-last ADS-B target.

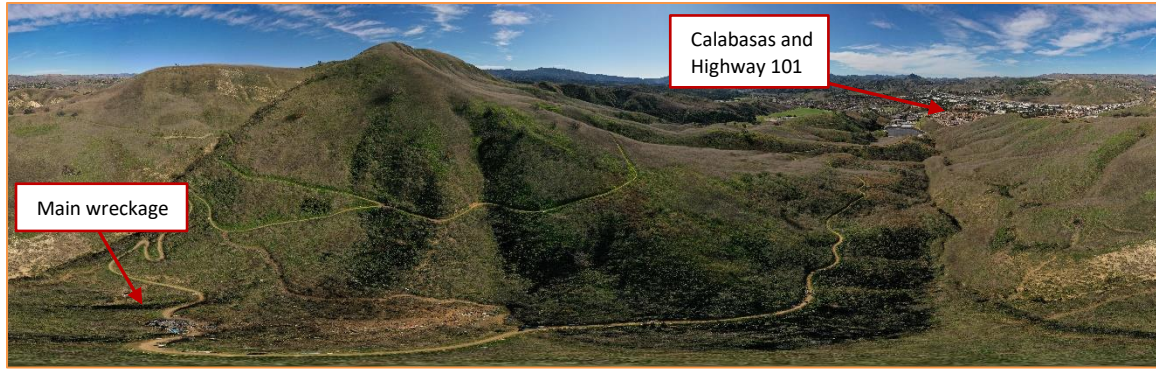


Figure 5. Flattened panoramic photo of entire area.

3.0 Attachments:

1. Google Earth kmz
2. Orthomosaic geo-tiff
3. Flight path replication video
4. Panoramic photo