National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

DCA22FA132

UNCREWED AIRCRAFT SYSTEM / AERIAL IMAGERY

Specialist's Factual Report

February 28, 2023

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A. ACCIDENT

Location:	Miami, FL
Date:	June 21, 2022
Time:	1738 Eastern Daylight Time 2138 Universal Coordinated Time
Airplane:	Boeing (McDonnell Douglas) DC-9-82, HI-1064, RED Air flight 203

B. UNCREWED AIRCRAFT SYSTEM / AERIAL IMAGERY PERSONNEL

Investigator in Charge (IIC)	Sathya Silva National Transportation Safety Board (NTSB) Washington, DC
Specialist/Remote Pilot in Command (RPIC)	Eric Gregson NTSB HS-22, Washington, DC
Specialist/Visual Observer (VO) and Imagery Processing	Catherine Gagne NTSB AS-70, Washington, DC (based in Marietta, GA)

C. DETAILS OF UAS USE – EQUIPMENT AND PROCEDURES

UAS flights were conducted on June 23, 2022, using a DJI Phantom 4 Pro V2 small UAS (sUAS), which was equipped an FC6310 camera (with the Sony Exmor 1" CMOS sensor with a focal length of 8.8 mm) and a dual GPS/GLONASS receiver, which provided georeferenced information on all still photographs. Each photograph was captured in jpg format with a resolution of 20 megapixels.

To obtain imagery for the orthomosaic map, the sUAS was flown over the main wreckage in an overlapping double grid, flown at a height of 150 ft above ground level (agl) and two orbits at approximately 75 ft agl and 50 ft agl, respectively. Nine flights were conducted at a height of 150 ft agl in overlapping double grid from the wreckage site west along runway 9 covering approximately 6,800 feet. Total flight time was 2 hours 55 minutes. Note that some wreckage items had been collected for examination or moved before the imagery was captured.

D. DETAILS OF AERIAL IMAGERY AND PROCESSING

The sUAS captured 2,434 high-resolution, georeferenced photographs suitable for processing in the Pix4D photogrammetry software. Individual photographs

of the main wreckage and/or ground marks were provided to the investigative team. The 2,434 photographs were processed using Pix4D to create a single high-resolution orthomosaic map overlay in Google Earth (in .kml format). Due to the file size of the high-resolution product, the processing area was reduced to exclude the imagery captured of the grassy areas north and south of runway 9.

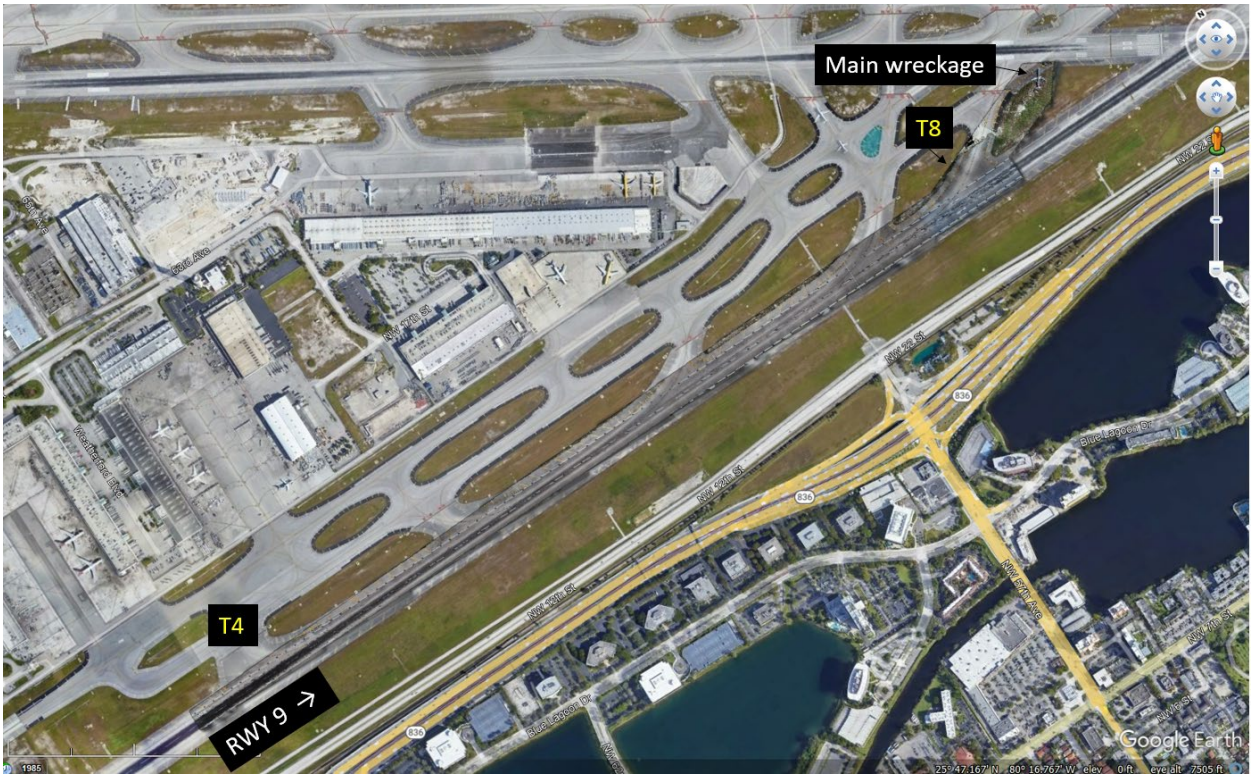

Figure 1. Annotated screen capture of the orthomosaic map overlay in Google Earth, showing processed area of the imagery captured by the sUAS. The mapped area begins west of taxiway T4, extends east along runway 9 to the location of the main wreckage, and includes part of taxiway T8.

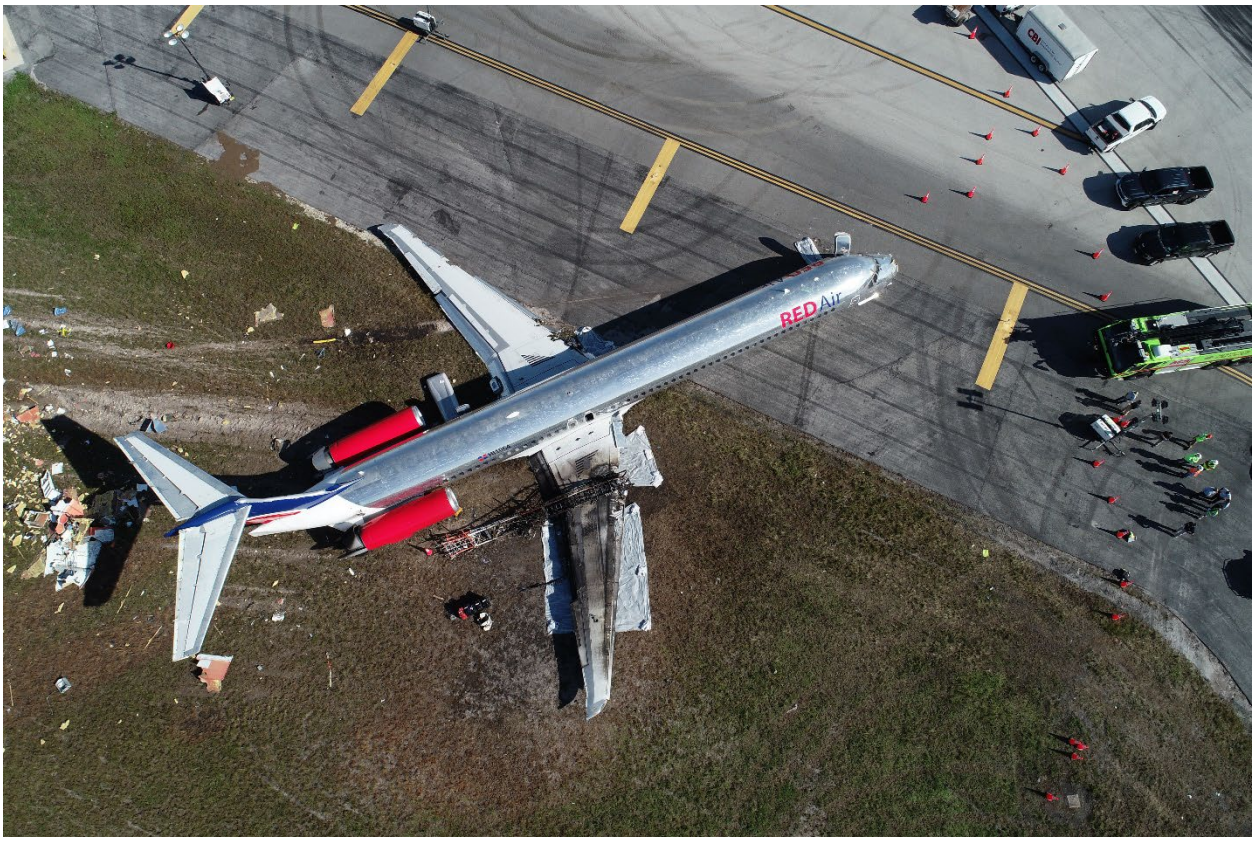

Figure 2. Overhead image of the wreckage captured by the sUAS. (Source: DJI_0043.jpg)

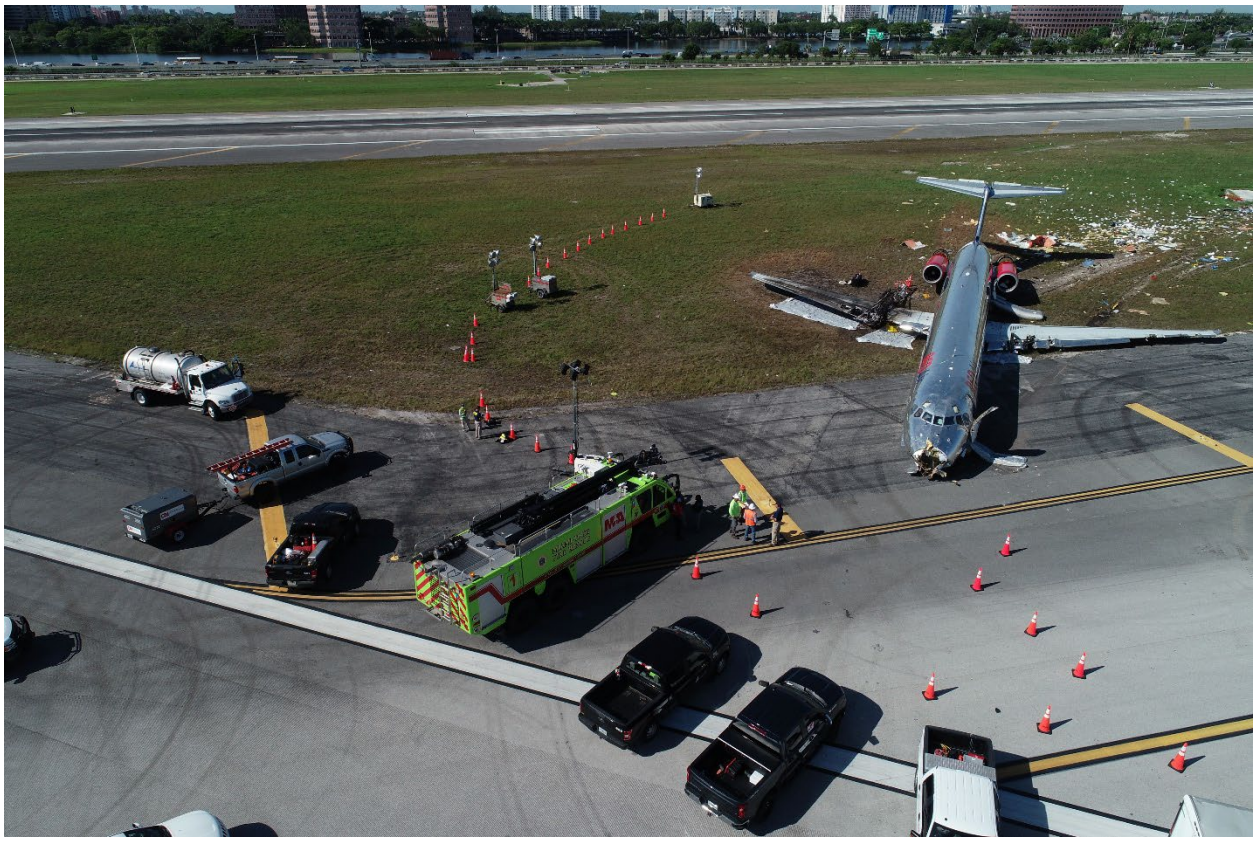

Figure 3. Cropped overhead image of the wreckage captured by the sUAS. (Source: DJI_0214.jpg)

Submitted by:

Eric Gregson
UAS RPIC

Catherine Gagne
UAS Aerial Imagery Processing

Attachment:
DCA22FA132_high_res_map.zip