

# **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Washington, D.C. 20594

## **UAS Aerial Imagery Summary**

05/30/2024

### **A.     ACCIDENT                      ERA24FA217**

Location:                      Franklin, Tennessee  
Date:                              May 15, 2024  
Time:                              1204 Local Time (CDT)  
Event:                              Airplane in-flight breakup and impact with terrain

### **B.     PERSONNEL**

UAS RPIC/VO:                Aaron Sauer  
                                        National Transportation Safety Board  
                                        Aurora, Colorado

UAS RPIC/VO:                Daniel Donegan  
                                        City of Franklin Fire Department  
                                        Franklin, Tennessee

### **C.     ACCIDENT SUMMARY**

On May 15, 2024, at 1204 central daylight time, a Beech, V35-TC, N47WT, was substantially damaged when it was involved in an accident near Franklin, Tennessee. The private pilot and 2 passengers sustained fatal injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

While transitioning the area enroute to Bowman Field Airport (LOU), Louisville, Kentucky, from Louisiana Regional Airport (REG), Gonzales, Louisiana, while at 10,000 ft msl, on a northeast track, the pilot descended to 7,500 ft msl and there were minor fluctuations in the altitude. As the airplane approached the Franklin, Tennessee, area, the pilot made a turn to the right back towards the southwest. During the turn, the airspeed and rate of descent increased rapidly until ADS-B flight tracking data ceased about 4,500 ft. The airplane suffered a catastrophic anomaly and broke up in flight; this was supported by the wreckage path which was spread over ½ a mile in a fan like pattern from east to west. In addition, eyewitness statements and video recording showed wreckage fragments descending out of the cloud layer about 3,000 ft up. The pilot was communicating with air traffic control at the time of the accident.

## **D. PURPOSE OF FLIGHTS**

The UAS was requested and deployed to assist in a search for missing airplane debris and components. During preliminary discussions with the NTSB IIC and local authorities, information was provided on search areas and high probability targets of interest based on already located debris and wreckage. Using this information, multiple areas were initially setup to conduct visual and ground search patterns (see figure 1). The search patterns were flown at an altitude of about 250 ft above ground level at the NADIR position. The drone target speed was about 15 miles per hour. Prior to the RPIC's arrival, multiple ground searches were conducted by local authorities and emergency management personnel which located a majority of the airplane wreckage.

## **E. DETAILS OF IMAGERY**

### **1.0 Equipment and Procedures**

#### **Equipment**

Mapping and viewpoint flights of the accident site were conducted on May 16, 2024, using the NTSB Parrot ANAFI Ai and the City of Franklin Fire Department DJI Matrice M30T. The Parrot drone is equipped with a dual GPS/GLONASS receiver which provides georeferenced information on all still photos and with a 48MP ½" CMOS sensor, with a focal length of 24 mm. Still photo resolution is 48 megapixels in JPG or RAW format. Videos were taken in MP4 format with 4K resolution at 30 frames per second. The DJI Matrice M30T drone is equipped with a wide-angle camera that includes a 12 MP ½" CMOS sensor with a focal length of 4.5 mm. The zoom camera includes a 48 MP ½" CMOS sensor with a focal length between 21-75 mm. The drone includes a thermal imaging camera with laser rangefinder capability. Videos were taken in MP4 format with 4K resolution at 30 frames per second.

#### **Procedures**

The accident site was located near Interstate 840 and the Natchez Trace Parkway in Franklin, Tennessee. The debris field began on the eastern side of I-840 and concluded at a small lake about ¾ miles to the west. Airplane wreckage was found on the roadways, in heavily wooded terrain, and residential properties. The accident site was in class G airspace with no restrictions. Flights were conducted under the provisions of 14 CFR Part 107.

The UAS was flown in single grids and free flight over the region of interest at various altitudes from multiple launch points. Flight time was approximately 2 hours in total.

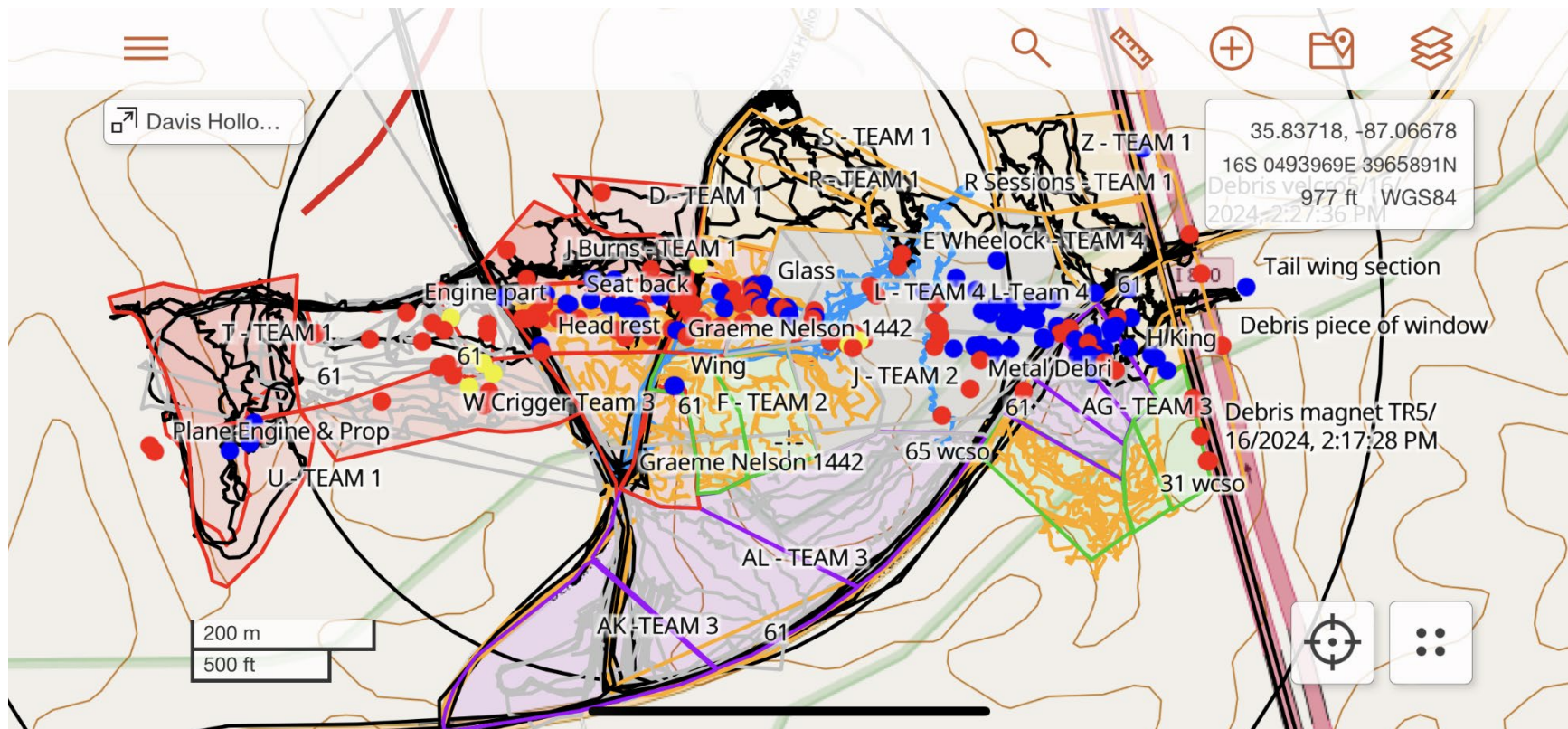
It should be noted that the wreckage was in the process of being removed during the mapping flights.

## **Processing**

Geo-referenced still imagery was initially processed using Pix4D photogrammetry software to provide a low-resolution 3D point cloud and an orthomosaic map. Full resolution point cloud, maps, terrain and surface modeling, and high-resolution processing images are shown in the summary.

### **2.0 Imagery products**

Approximately 1,200 high resolution photos and 8 videos were obtained. Select source photos, orthomosaics, digital surface model, and point clouds snapshots are included below. The orthomosaic was exported in Google Earth tiles .kmz format.



**Figure 1. Local authorities search map layout (Cal Topo Application)**



**Figure 2. Orthomosaic overlay on Google Earth with debris field (area of initial and final debris) measurement.**



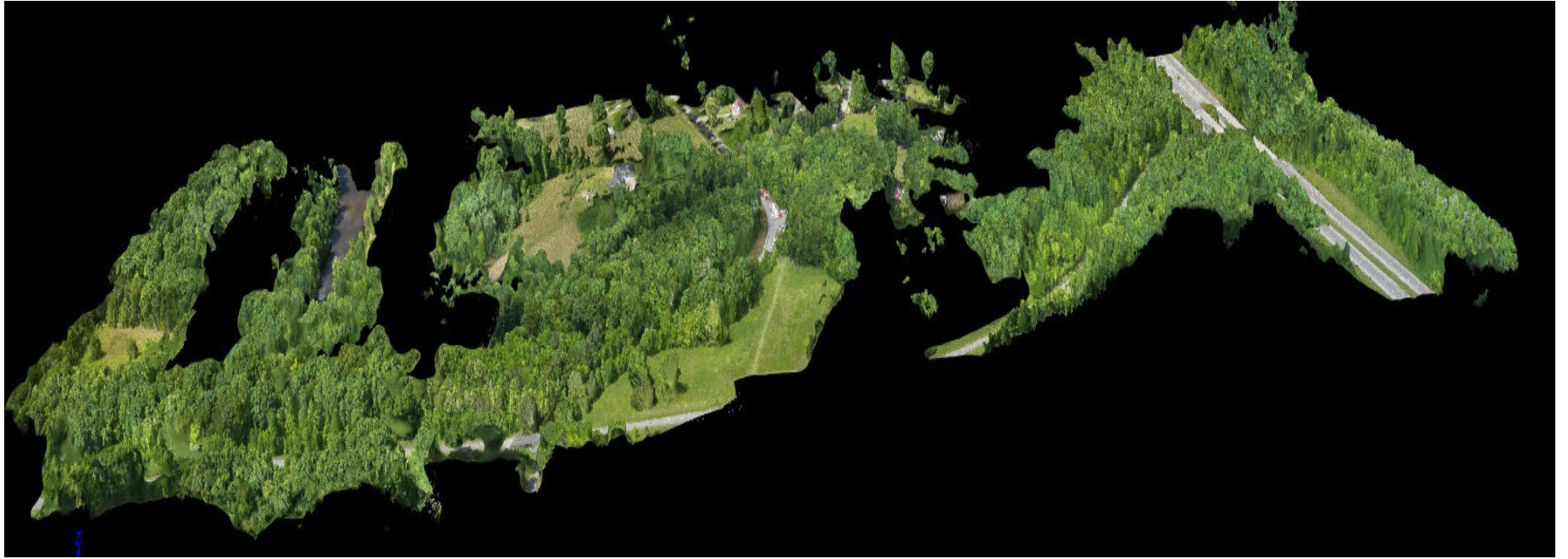
**Figure 3. Orthomosaic overlay on Google Earth with debris field measurement (area of initial and final debris) and heading.**



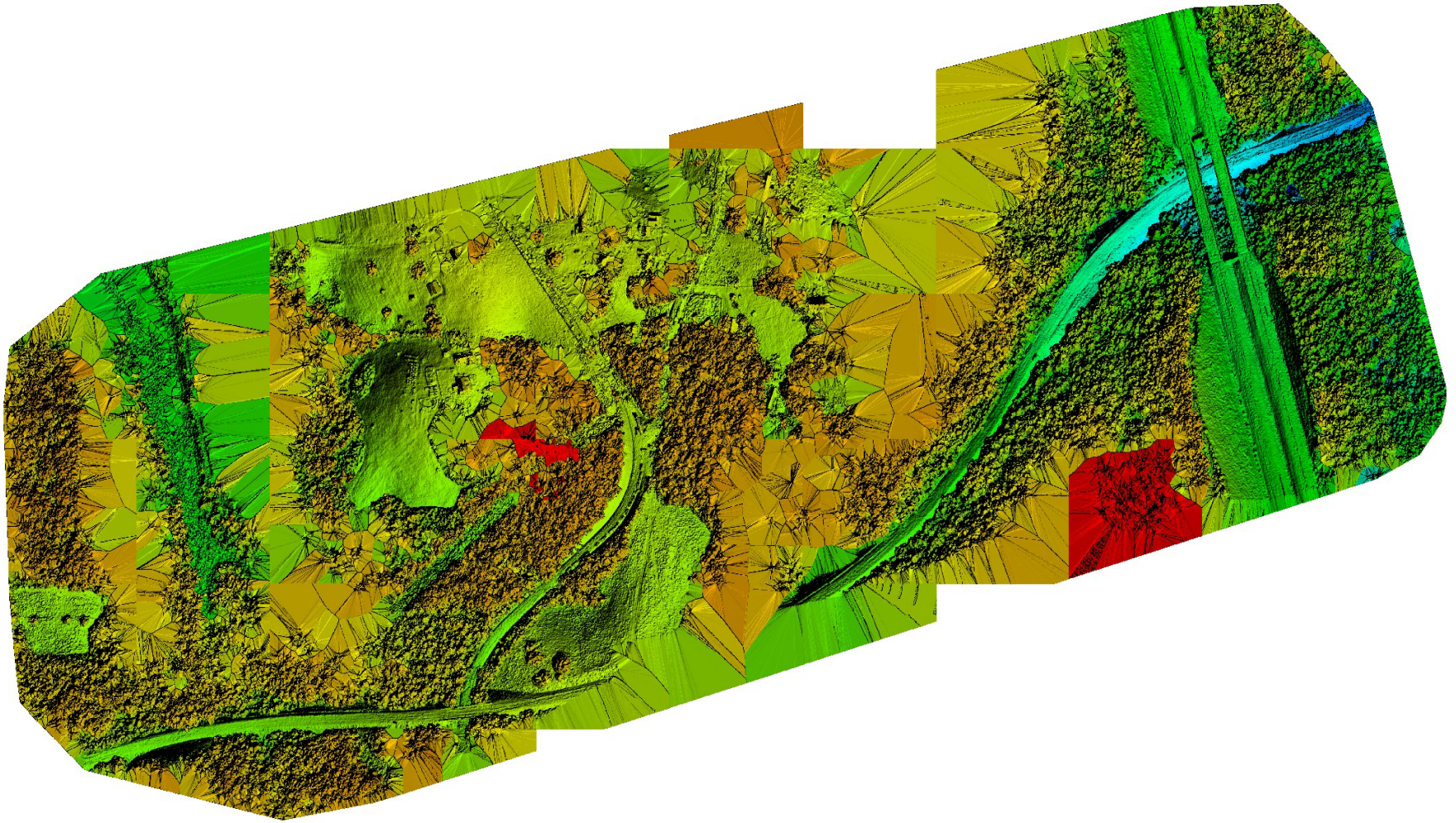
**Figure 4. Orthomosaic overlay on Google Earth with some major debris components identified.**



**Figure 5. Orthomosaic overlay on Google Earth with some major debris components identified.**



**Figure 6. Densified point cloud of accident site area.**



**Figure 7. Digital surface model of accident site area (highest elevation – red/lowest elevation – blue).**



**Figure 8. Oil/fluid sheen in a small lake; location of airplane engine and propeller.**