

# National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA23FA048

## **AIRWORTHINESS FACTUAL REPORT**

October 24, 2023

## TABLE OF CONTENTS

|                                                        |    |
|--------------------------------------------------------|----|
| A. ACCIDENT.....                                       | 3  |
| B. AIRWORTHINESS FACTUAL REPORT.....                   | 3  |
| C. SUMMARY.....                                        | 3  |
| D. DETAILS OF THE INVESTIGATION .....                  | 3  |
| E. AIRPORT INFORMATION .....                           | 3  |
| F. HISTORY OF FLIGHT.....                              | 6  |
| 1.0 THE ACCIDENT FLIGHT TO I35 AIRPORT.....            | 6  |
| 2.0 THE PILOT’S FLIGHT EXPERIENCE AT I35 AIRPORT ..... | 8  |
| G. WRECKAGE AND IMPACT INFORMATION.....                | 12 |
| H. AIRFRAME EXAMINATION.....                           | 13 |
| I. ENGINE EXAMINATION .....                            | 14 |
| J. MAINTENANCE HISTORY .....                           | 15 |
| K. SUMMARY .....                                       | 15 |
| L. PHOTOGRAPHS .....                                   | 16 |

## **A. ACCIDENT**

Location: Harlan, Kentucky  
Date: November 3, 2022  
Time: 1009 eastern daylight time  
1409 UTC  
Airplane: Beech A36, N84R

## **B. AIRWORTHINESS FACTUAL REPORT**

IIC Adam Gerhardt  
National Transportation Safety Board  
Washington, DC

Party Member Sean Smith  
Federal Aviation Administration  
Louisville, Kentucky

Party Member Peter J. Basile  
Textron Aviation  
Wichita, Kansas

## **C. SUMMARY**

On November 3, 2022, about 1009 eastern daylight time, a Beech A36 airplane, N84R, was destroyed when it impacted terrain near the Tucker-Guthrie Memorial Airport (I35) Harlan, Kentucky. The private pilot was fatally injured. The airplane was operated by the pilot as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

## **D. DETAILS OF THE INVESTIGATION**

The NTSB investigator-in-charge traveled to the accident site and examined the wreckage on November 4 and 5th, 2022. He was assisted by a Textron Aviation party member and one Federal Aviation Administration (FAA) inspector. The wreckage was recovered on November 5th, 2022, and was transported to a secure recovery facility in Springfield, Tennessee.

## **E. AIRPORT INFORMATION**

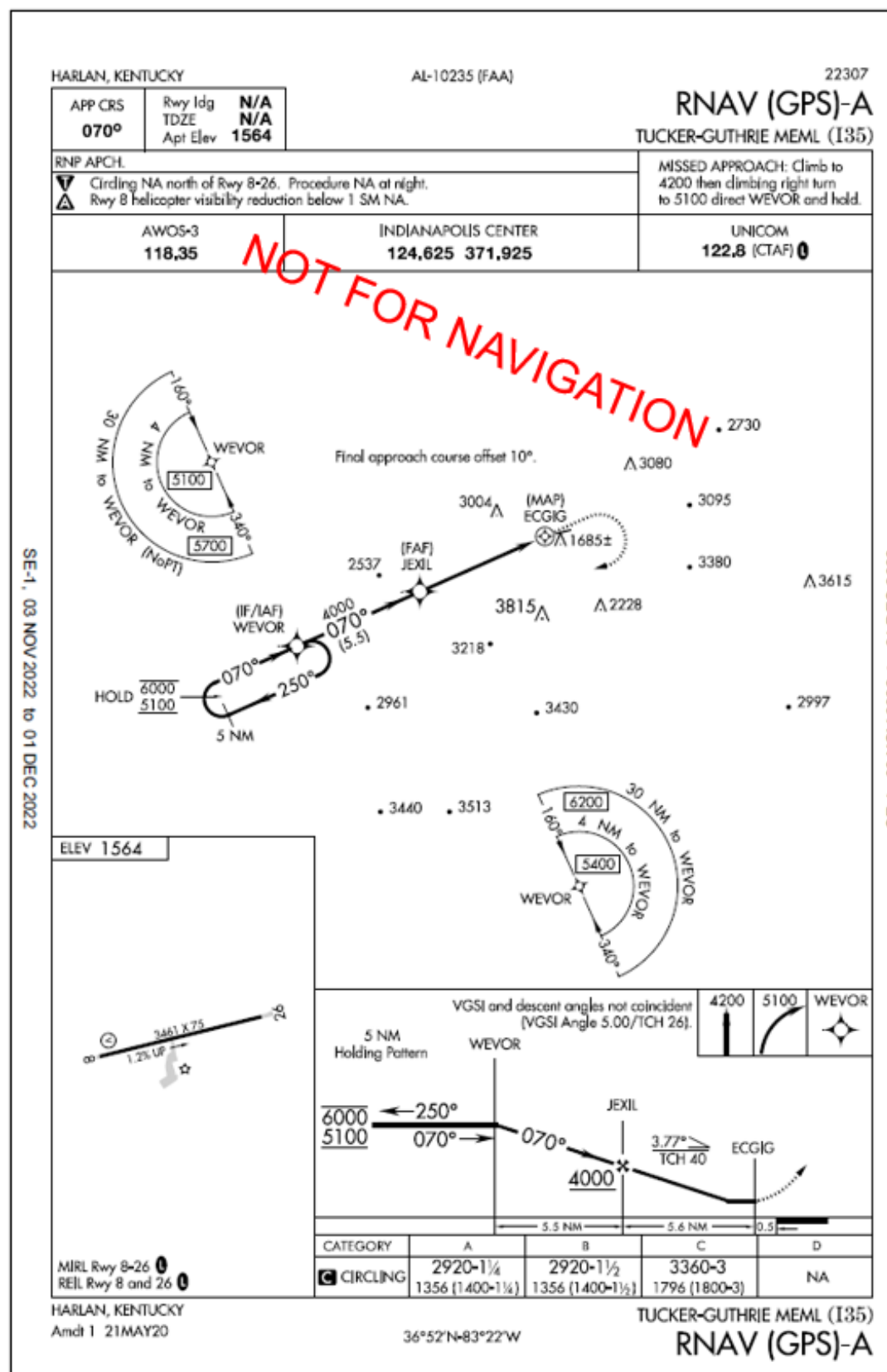
According to the FAA chart supplement, the I35 airport was located in mountainous terrain. The airport sat atop of a mined flattened mountain top at an elevation of 1,563 ft mean sea level. The terrain below was an elevation of about

1,172 ft msl. The airport had one runway (8-26), which was 3,461 ft long and 75 ft wide. The airport was equipped with a light beacon and runway 8 was equipped with runway end identifier lights. Approaching runway 8, the terrain featured a steep rock wall ravine about 350 ft prior to the runway threshold. Figure 1 provides a view of the terrain approaching runway 8 at I35 airport.



**Figure 1: View of the terrain approaching runway 8 at I35 airport.**

The I35 airport had one instrument approach procedure published at the airport. The approach was a GPS-A instrument approach procedure off set from the runway by 10°. The circling minimum descent altitude was 2,920 ft mean sea level (1,356 ft above ground level (agl)). The weather minimums prescribed on the approach procedure were a ceiling of 1,400 ft agl and 1 ¼ mile visibility for Category A aircraft (or 1 ½ visibility for Category B). Figure 2 below displays the RNAV GPS-A approach at I35 airport.



## Notices to Air Missions (NOTAMs)

There were two NOTAMs in effect at the time of the accident at I35.

LOU 01/195 I35 RWY 08 VASI U/S 2201072245-2301012359 (VASI unusable)

*Louisville Region, 195th NOTAM of January for I35 Aerodrome, runway 8 visual approach slope indicator lights unserviceable from 01-07-22 at 2245 UTC to 01-01-23 at 2359 UTC*

LOU 10/231 I35 AD AP LGT ALL U/S 2210190929-2310202359

*Louisville Region, 231st NOTAM of October for I35 Aerodrome, airport lighting all unserviceable from 10-19-22 at 0929 UTC to 10-20-23 at 2359 UTC*

## **F. HISTORY OF FLIGHT**

### **1.0 The Accident Flight to I35 Airport**

According to FAA ADS-B data and commercially available flight track data from FlightRadar24, the airplane departed from Knoxville Downtown Island Airport (DKX) Knoxville, Tennessee, at 0932 local. There was no record of a flight plan for the flight, weather briefing, or communication with air traffic control.

The flight track was consistent with a route of flight the pilot had entered into the application Foreflight the day of the accident at 0929. The route contained a combination of user defined waypoints and the I35 airport. The reported ADS-B altitude data for the entirety of the flight was in error and did not correspond to a reliable number.

Recorded audio of the I35 Unicom frequency was obtained from LiveATC.net. The audio file identified as "ATC I35 Nov 3 2022 1330Z" contained one transmission from the accident pilot<sup>1</sup>. At 27 minutes, 4 seconds (audio track time) the following was heard; "Harlan Tucker Guthrie Bonanza 84R is two and a half to the west will circle for landing Harlan Tucker Guthrie." There were no further transmissions identified in the recorded audio.

The flight track data revealed that the airplane completed multiple approaches and maneuvering over the airport environment.

---

<sup>1</sup> Refer to the NTSB Public Docket to download the audio file.

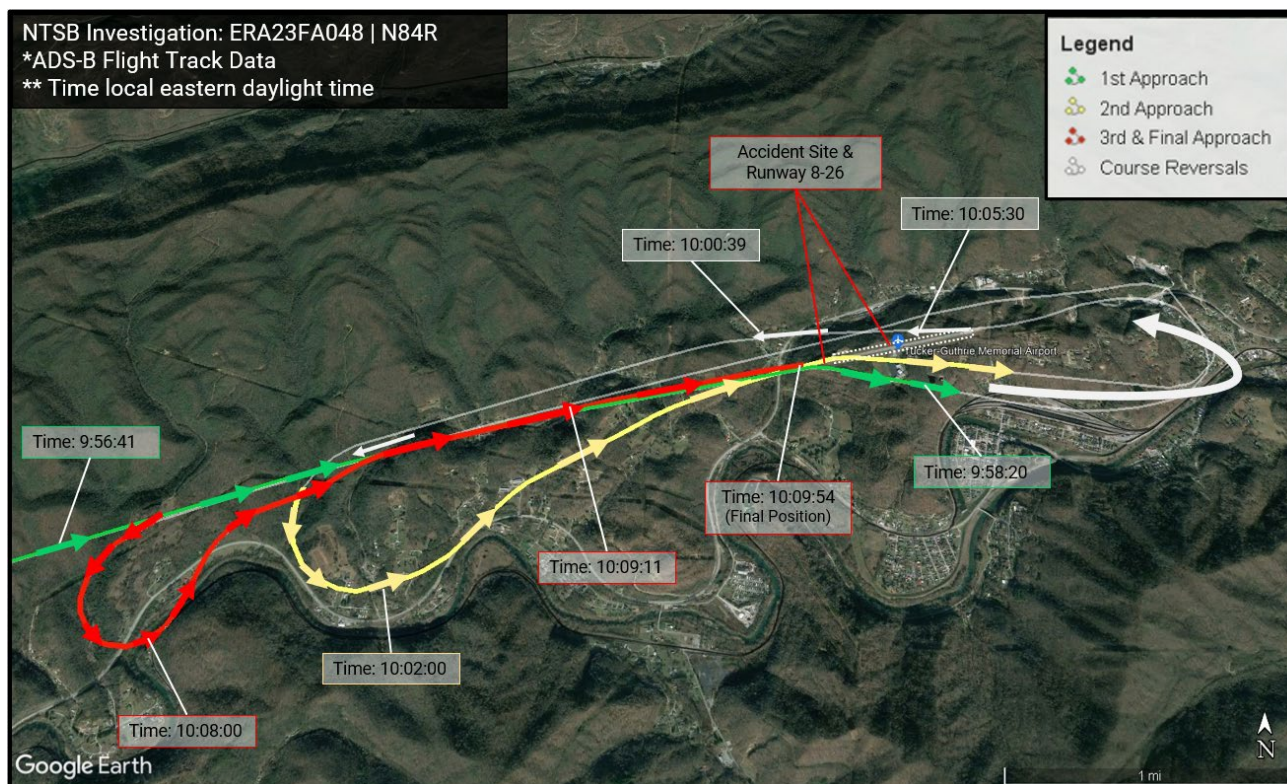
At 0958 EDT, the aircraft flew over Runway 8 at an undetermined altitude and made a slight right turn followed by a left 180° teardrop turn. This was the first pass over runway 8.

At 1000 EDT, the aircraft flew over Runway 26 on an extended center line before it made another left teardrop 180° turn back toward Runway 8.

At 1002 EDT, the aircraft made a second pass over Runway 8 before it made a slight right turn again and another left 180° teardrop turn to fly the reciprocal runway heading.

At 1005 EDT, the aircraft flew down Runway 26 on a longer extended centerline before it made a tighter left 180° teardrop turn to intercept the approach course heading for a third attempted landing on Runway 8.

At 1009 EDT, the aircraft flew an approach toward Runway 8 and descended into the rocks. The last recorded position was at 1009:54, about .10 nautical mile from the runway 8 threshold. Figure 3 displays an overview of the ADS-B flight track.



**Figure 3: ADS-B flight track displaying the three approaches to runway 8 in addition to the 180° left teardrop turns (displayed in white). The green line represents the first approach. The yellow line represents the second approach, and the red line represents the third and final approach.**

According to a pilot-rated witness that was at the I35 airport terminal, he heard the accident airplane complete two approaches to runway 8. The first approach seemed to be high, and the second approach sounded "really low". For both passes the witness reported that the engine noise was a steady piston engine sound, with no noticeable increases or decreases in power.

After the second pass, the witness assumed the airplane had performed a missed approach. The engine sound became more distant from the airport, and he did not hear the accident airplane again, nor did he hear any sort of boom or the accident airplane's eventual impact with terrain.

The witness reported that at the time of the two passes the weather conditions were very foggy. He reported that he could see no farther than the south runway edge area and the red 8-26 runway sign from the FBO fuel/ ramp area. As measured in Google Earth, this distance was about 250 - 300 ft.

## **2.0 The Pilot's Flight Experience at I35 Airport**

According to the pilot's family and airport personnel, the pilot was a physician and frequently traveled from the Knoxville, Tennessee area to the I35 airport to practice medicine in the local area. Review of commercially available flight track data for the accident airplane and review of the pilot's logbook found that within the past year, he flew into the airport at least 40 times.

A review of the aircraft flight history on Flightradar24 from August 1, 2022, to November 1, 2022, indicated over 35 flights originating from either McGhee Tyson Airport (KTYN) or Knoxville Downtown Island Airport (KDKX) to Middlesboro Bell County Airport (1A6) or I35 airport. The 1A6 airport was along the route of flight between DKX and I35, located about 23 miles southwest from I35. In the three months preceding the accident, the pilot landed at I35 at least 15 times.

### September 27, 2022 DKX - I35 Flight

According to the pilot's logbook and flight track data, the pilot completed a flight on September 27, 2022, involving a similar route of flight flown during the accident flight. The time of arrival at I35 was 0950 local (1350 UTC). The METARs at I35 published around the time of the approach were instrument flight rule (IFR) conditions below the minimums prescribed for the GPS-A approach. The METAR published nearest to the time of the landing observed a ceiling at 100 ft broken clouds and 10 statute miles of visibility. Shortly before the approach, visibility was report as 1/4 statute miles and the ceiling was overcast at 100 ft.

9/27/2022, 9:55AM Local: METAR KI35 271355Z AUTO 00000KT 10SM  
BKN001 07/07 A3009 RMK AO2 T00660066=

9/27/2022, 9:35AM Local: METAR KI35 271335Z AUTO 00000KT 1/4SM  
OVC001 06/06 A3009 RMK AO2 T00630063=

Review of the flight track data showed that the flight completed one pass over runway 8 before completing a 180° left turn to fly a parallel course over runway 26. The airplane then completed a left turning 180° teardrop back towards runway 8 in which a landing was made. The flight track was not consistent with the GPS-A approach procedure.



**Figure 4: September 27, 2022 flight into I35.**

#### September 6, 2022 Arrival to I35 Flight

According to the pilot's logbook and flight track data, the pilot completed a flight on September 6, 2022, to I35. The time of arrival was 1048 local (1448 UTC). The METARs at I35 published around the time of the approach were IFR conditions below the minimums prescribed for the GPS-A approach. The METAR published nearest to the time of the landing observed a broken ceiling at 500 ft and 10 statute miles of visibility.

9/6/2022, 10:55AM Local: METAR KI35 061455Z AUTO 27003KT 10SM  
BKN005 BKN020 BKN110 22/22 A3011 RMK AO2 T02210221=

9/6/2022, 10:35AM Local: METAR KI35 061435Z AUTO 00000KT 10SM  
BKN005 OVC018 22/22 A3010 RMK AO2 T02170217=

Review of the flight track showed that the pilot completed a straight-in approach to landing.



**Figure 5: Flight track data from the pilots September 6, 2022 flight into I35.**

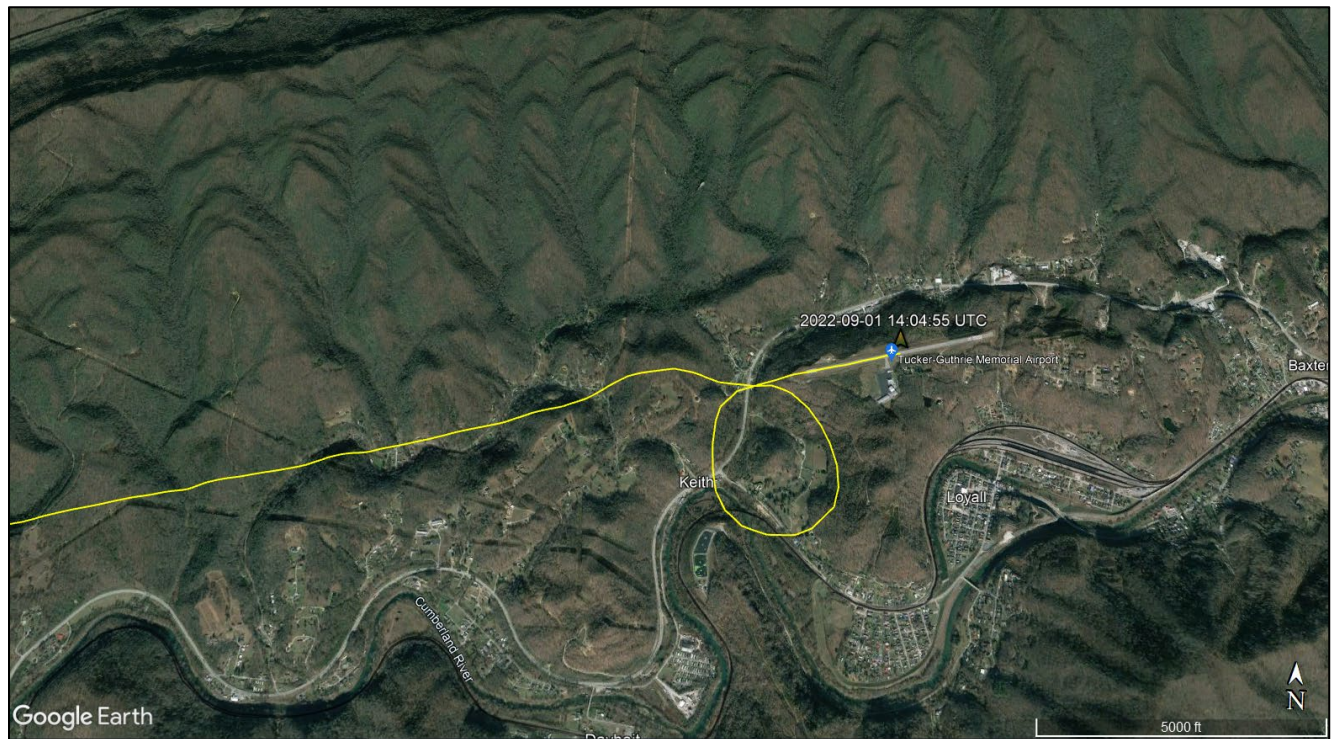
#### September 1, 2022 Arrival to I35 Flight

According to the pilot's logbook and flight track data, the pilot completed a flight on September 1, 2022, to I35. The time of arrival was 1004 local (1404 UTC). The METARs at I35 published around the time of the approach were IFR conditions below the minimums prescribed for the GPS-A approach. The METAR published nearest to the time of the landing observed a broken ceiling at 300 ft and 10 statute miles of visibility. Shortly before the approach, visibility was report as 7 statute miles and the ceiling was overcast at 100 ft.

9/1/2022, 10:15AM Local: METAR KI35 011415Z AUTO 00000KT 10SM  
BKN003 18/17 A3016 RMK AO2 T01750170=

9/1/2022, 09:55AM Local: METAR KI35 011355Z AUTO 00000KT 7SM OVC001  
16/16 A3016 RMK AO2 T01610161=

The pilot completed a straight-in approach to runway 8, however, prior to landing a 360° turn was completed before rejoining the final approach and landing on runway 8.



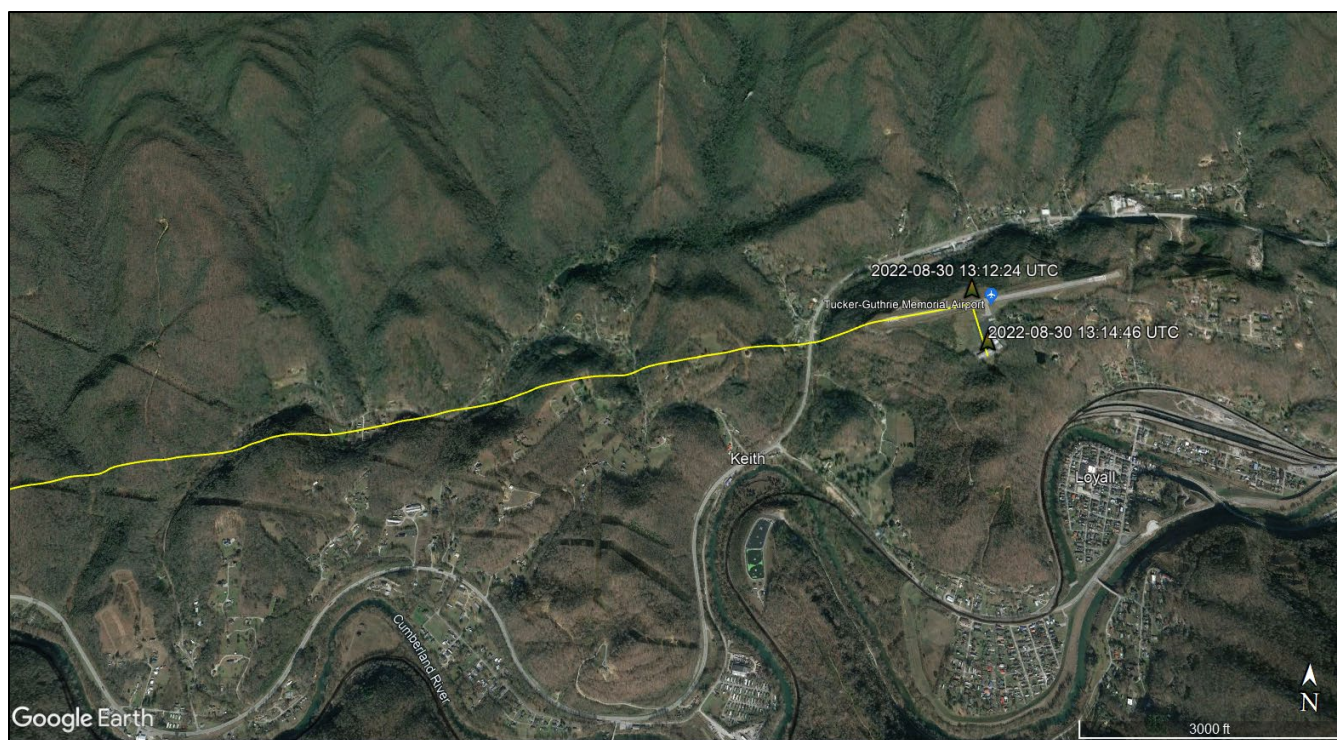
**Figure 6: Flight track data from the pilots September 1, 2022 flight into I35**

#### August 30, 2022 Arrival to I35 Flight

According to the pilot's logbook and flight track data, the pilot completed a flight on August 30, 2022, to I35. The time of arrival was 0912 local (1312 UTC). The METARs at I35 published around the time of the approach were IFR conditions.

8/30/2022, 09:15AM Local: METAR KI35 301315Z AUTO 00000KT 2SM  
SCT003 BKN023 OVC030 20/20 A3006 RMK AO2 T02000200=

8/30/2022, 08:55AM Local: METAR KI35 301255Z AUTO 26004KT 10SM  
BKN003 OVC039 20/20 A3006 RMK AO2 T02040204=



**Figure 7: Flight track data from the pilots August 30, 2022 flight into I35**

#### August 28, 2018 Flight to I35

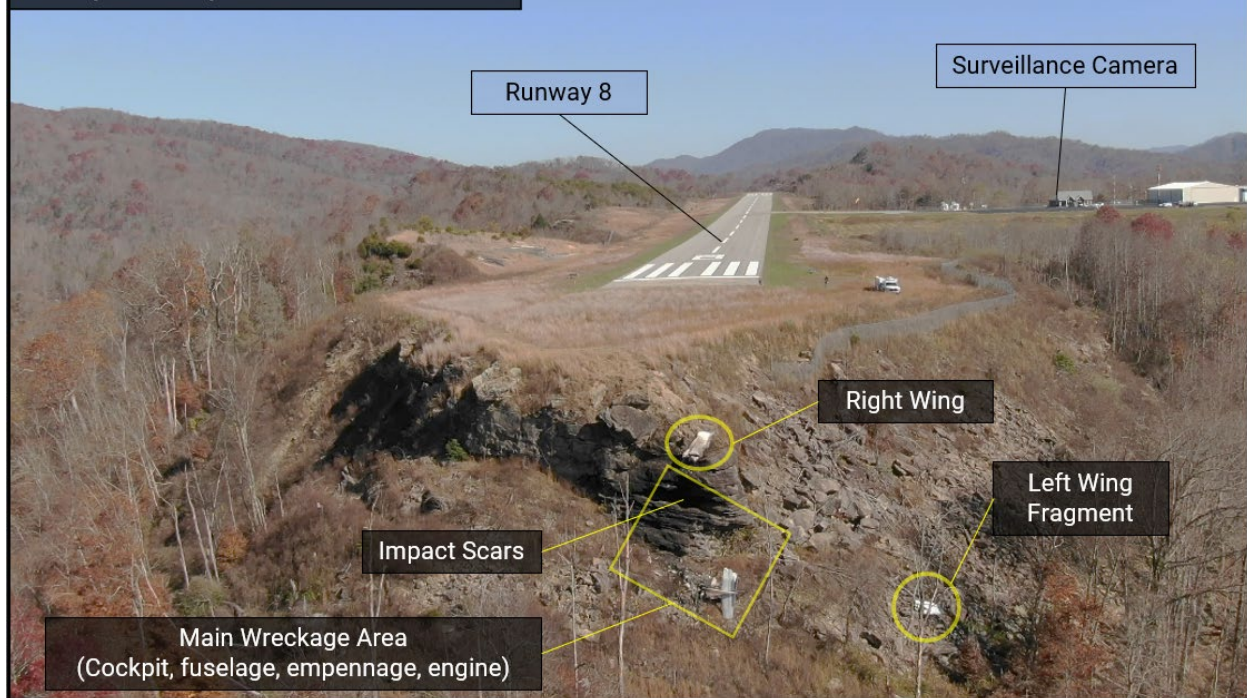
An additional notable flight was located in the pilot's logbook, with an arrival to I35. The flight track data was not available, and the landing time was not known. The pilot remarks entry stated that the weather conditions at I35 were IFR, with cloud ceilings reported at 100 ft and visibility at 1/4 statute miles. The remarks further stated that he conducted a "fly by" to check the ceiling and "confirmed" the weather conditions. He then diverted to 1A6 airport. The logbook remark stated:

*"Pilot: IFR at i35 did a fly by to check ceiling reported at 100 and .25 viz. Confirmed, went back to 1a6"*

### **G. WRECKAGE AND IMPACT INFORMATION**

The airplane impacted a ravine and steep rock wall about 50 ft below the runway elevation and 375 ft from the runway 8 threshold. All major portions of the airplane were located, and a post-crash fire consumed a majority of the cockpit, fuselage, and portions of the left wing.

NTSB Investigation: ERA23FA048 | N84R  
Drone photograph taken one day after the accident.  
Courtesy of Kentucky State Police.



**Figure 8: Overview of the airport environment and distribution of wreckage**

## **H. AIRFRAME EXAMINATION**

The cockpit, switches, levers, and flight instruments were all severely damaged by fire. It was not possible to obtain any instrument reading from any of the recovered instrumentation. The attitude indicator was disassembled, and its gyro and housing were observed. Evidence of rotationally scoring was observed inside the housing and the gyro.

Flight control cable continuity was established from the elevator, rudder, and elevator trim tabs to the fire damaged forward cabin area. The autopilot pitch control bridle cable remained wrapped around the capstan and was securely fastened to the elevator cable. The elevator trim tab cable was engaged on the electric trim motor capstan. The left and right aileron control cable ends were identified in the forward cabin area and traced to the outboard wing areas where they were separated in tensile overload.

The fuel selector was destroyed by the post-crash fire. The landing gear were located in the debris field. The position of the landing gear could not be determined due to the impact and fire damage. Flap configuration was not determined due to impact and fire damage.

## **I. ENGINE EXAMINATION**

The engine was a Continental IO-520-BA piston engine (SN 822926-R). The engine had separated from its engine mounts and airframe. The engine exhibited impact damage and post-impact fire damage. The crankcase was fractured, and the crankshaft would not rotate; compression and continuity were not established. All rocker covers were removed. There was no evidence of engine damage to any of the valves or rockers. The oil filter was located in the debris. The casing was intact and displayed a written date of May 11, 2022, tach time 1010.2. The oil filter was removed, cut open and spread out. There were no metal contaminants observed.

The spark plugs were removed and examined. When compared to the Champion Check-A-Plug chart, all top spark plugs exhibited a worn out, normal to severe condition.

### TOP SPARK PLUGS:

No. 1: Worn Out - Normal

No. 3: Worn Out - Severe

No. 5: Worn Out - Normal

No. 2: Worn Out - Normal

No. 4: Worn Out - Normal

No. 6: Worn Out - Severe

### BOTTOM SPARK PLUGS:

No. 1: Worn Out - Normal

No. 3: Worn Out - Severe

No. 5: Worn Out - Normal

No. 2: Impact damaged, were not removed.

No. 4: Impact damaged, were not removed.

No. 6: Impact damaged, were not removed.

The fuel manifold was safety wired and remained partially attached to the engine. When disassembled, its fuel filter screen was clear of debris and the manifold smelled of aviation gas. The magnetos had separated from the engine. Both magnetos produced spark at all leads via the impulse coupling when turned by hand.

The majority of the engine accessories were separated from the engine. The vacuum pump remained attached to the engine accessory section. When the pump was partially assembled, its gear were intact and the unit appeared normal. The engine was attempted to be rotated by hand; however, it would not rotate.

All propeller blades had separated from the propeller hub. Only one propeller blade was recovered at the accident site. The blade exhibited tip curling and leading edge gouging.

## **J. MAINTENANCE HISTORY**

The original airplane maintenance records were not located. According to a copy of a maintenance endorsement, preserved by the mechanic who performed the work, the most recent annual inspection was completed on December 12, 2021. At the time of inspection, the tachometer hours were 0945.6, with a total time in service of 5,416.6 hours. The total time since major engine overhaul was noted as 228.1 hours.

## **K. SUMMARY**

There was no evidence of preimpact mechanical malfunction with the airframe or engine.

## **L. PHOTOGRAPHS**



**Photo 1: View of the accident airplane after the impact with terrain. Photo Courtesy of Kentucky State Police.**



**Photo 2: Overview of the accident site. Photograph courtesy of the Kentucky State Police.**



**Photo 3: View of the right wing recovered from the accident site.**



**Photo 4: View of the left wing fragment.**



**Photo 5: View of the right wing as located at the accident site.**



**Photo 6: View of the empennage after its recovery from the accident site.**



**Photo 7: View of a propeller displaying tip curling and leading edge abrasions and gouging.**



**Photo 8: View of the engine as found at the accident site.**



**Photo 9: View of the engine oil filter as viewed during its removal and examination.**



**Photo 10: View of the vacuum pump attached to the engine, as found at the accident site.**



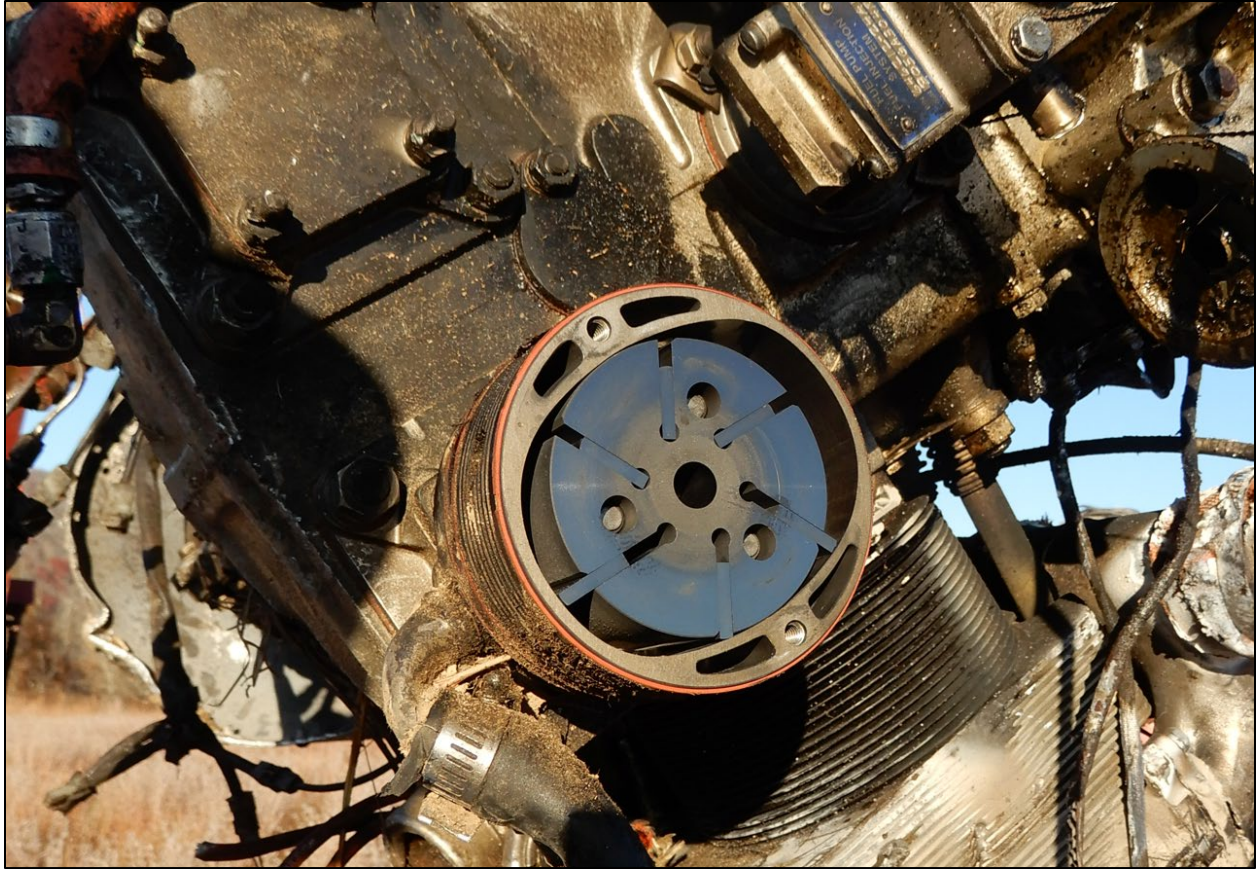
**Photo 11: Internal view of the attitude indicator gyro housing. As viewed during its disassembly by the investigative team.**



**Photo 12: View of the Nos. 1, 3, and 5 cylinders partially disassembled by the investigative team.**



**Photo 13: View of the Nos. 2, 4, and 6 cylinders partially disassembled by the investigative team.**



**Photo 14: View of the vacuum pump, as viewed partially disassembled by the investigative team.**



**Photo 15: View of the attitude indicator gyro, as viewed during disassembly by the investigative team.**



**Photo 16: View of the fuel manifold filter screen, as viewed when disassembled by the investigative team.**

Submitted by:

Adam Gerhardt  
Senior Air Safety Investigator