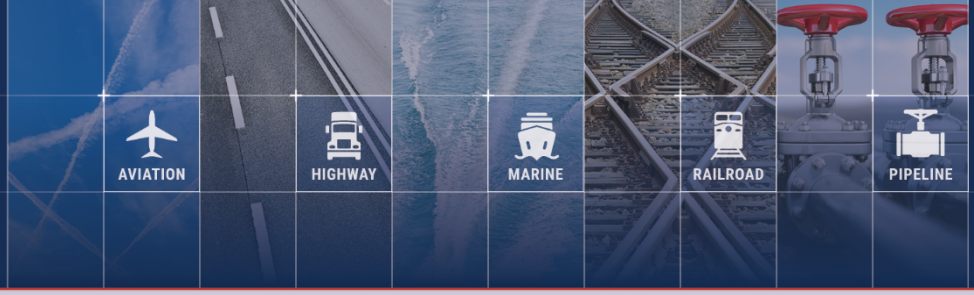

Aviation Investigation Final Report

Location:	Macon, Mississippi	**Accident Number:**	ERA12FA376
Date & Time:	May 31, 2012, 16:56 Local	**Registration:**	N976S
Aircraft:	HAWKER BEECHCRAFT A36	**Aircraft Damage:**	Substantial
Defining Event:	Windshear or thunderstorm	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While on a long cross-country flight on an instrument flight rules flight plan, the pilot attempted to fly through a line of thunderstorms. The airplane was equipped with satellite radar weather (NEXRAD Composite) and a stormscope/strikefinder. Using his equipment and talking with air traffic controllers, the pilot noted a break in the extreme precipitation, which still contained moderate to heavy precipitation, about 115 miles from the airplane's position. As the airplane approached that area, the pilot reported that a thunderstorm cell had filled it in; however, there was still a gap in the line of thunderstorms about 10 miles north. The pilot then attempted to fly to that gap and no further communications were received from the accident airplane. Review of the airplane's radar track was overlaid on a weather radar plot and revealed that the pilot attempted to fly though a Level 5, or heavy, thunderstorm cell. The turbulence from that cell resulted in an in-flight breakup of the airplane due to overstress, and the wreckage was scattered over a mile on the ground.

The satellite radar weather information, most likely displayed in the airplane cockpit when the pilot was attempting to fly to a gap in thunderstorm cells, was about 6 to 7 minutes old at the time of the accident and depicted the airplane in an area clear of precipitation. The airplane's stormscope/strikefinder would have provided real-time lightning information; however, it would have had significantly less detail than composite weather radar depictions and thus be less suitable for use in attempting to navigate through a line of thunderstorms and in between thunderstorm cells. Both sources of weather information used were less suitable than onboard weather radar, which would have provided real-time weather radar images in the cockpit. The pilot had obtained his instrument rating less than 2 years before the accident and had accrued about 32 total hours of actual instrument experience.

The NTSB recently issued a related Safety Alert, In-Cockpit NEXRAD Mosaic Imagery, viewable at www.ntsb.gov, describing how the actual age of NEXRAD data can differ significantly from the age displayed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to continue flight into an area of known thunderstorms, which resulted in an in-flight breakup. Contributing to the accident was the pilot's lack of experience in actual instrument meteorological conditions and his reliance on datalink weather radar imagery for tactical avoidance of convective weather.

Findings

Personnel issues	Decision making/judgment - Pilot
Aircraft	(general) - Capability exceeded
Personnel issues	Total instrument experience - Pilot
Personnel issues	Confidence/reliance on equip - Pilot
Environmental issues	Thunderstorm - Decision related to condition

Factual Information

History of Flight

Enroute-cruise	Windshear or thunderstorm (Defining event)
Enroute-cruise	Inflight upset
Enroute-cruise	Aircraft structural failure
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On May 31, 2012, at 1656 central daylight time, a Hawker Beechcraft A36, N976S, operated by a private individual, was substantially damaged during an in-flight break-up and collision with terrain near Macon, Mississippi. The certificated private pilot was fatally injured. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed near the accident site and an instrument flight rules flight plan was filed for the planned flight to University of Oklahoma Westheimer Airport (OUN), Norman Oklahoma. The flight originated from Saint Petersburg-Clearwater International Airport (PIE), Clearwater, Florida, at 1415.

According to air traffic control information provided by the Federal Aviation Administration (FAA), the pilot was in radio contact with Memphis Center at 1625 and the airplane was level at 20,000 feet. At that time, the center controller advised of extreme precipitation at the airplane's 12 o'clock position and 85 miles away, extending north and south. The pilot acknowledged the information and stated, "…I'm looking at that trying to see if there is any way I can get through it and I'm beginning to think there is…"

At 1626, the controller advised that there was a break in the extreme precipitation, but still moderate to heavy precipitation, on a heading of 330 degrees at 115 miles. The pilot stated that he saw that as well, and thought it would be the best spot to fly through the line of precipitation. The pilot received permission to deviate to that spot. At 1633, the controller asked the pilot if he had weather radar onboard, and the pilot replied that he had "Nexrad Composite." At 1636, the pilot requested a lower altitude to remain below the freezing level, and he ultimately descended to 12,000 feet. At 1653, the pilot advised the controller that a cell had filled in the area he wanted to fly through, but there was still a gap about 10 miles north. He planned to fly north 10 more miles before going through the gap. The controller acknowledged the pilot's intentions. No further communication was received from the accident airplane. At 1656:27, the speed information disappeared from the airplane's radar target, followed by the altitude information.

PERSONNEL INFORMATION

The pilot, age 53, held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA third-class medical certificate was issued on February 23, 2011. At that time, he reported a total flight experience of 258 hours. The pilot obtained his instrument rating on August 20, 2010. According to the pilot's logbook, he had accrued a total flight experience of approximately 342 hours; of which about 32 hours were in actual instrument meteorological conditions. The pilot had flown 23.8 hours and 9.8 hours during the 90-day and 30-day period preceding the accident, respectively; of which, 7.6 hours and 3.4 hours were in actual instrument meteorological conditions, respectively.

AIRCRAFT INFORMATION

The six-seat, low-wing, retractable tricycle-gear airplane, serial number E-3370, was manufactured in 2001. It was powered by a Continental IO-550, 300-horsepower engine, equipped with a three-blade constant-speed McCauley propeller. Review of the airplane's logbooks revealed that the most recent annual inspection was completed on June 14, 2011. At that time, the airplane had accumulated 1,337.0 total hours of operation. The engine had accumulated 358.0 hours since major overhaul. The airplane had flown about 200 hours since the annual inspection.

The airplane was equipped with XM WX Satellite Weather and an L3 (Goodrich) WX 500 Stormscope/Strikefinder.

METEOROLOGICAL INFORMATION

There was no record of the pilot receiving a weather briefing or filing a flight plan with flight service or direct user access terminals; however, the pilot's business partner reported that the pilot commonly used ForeFlight, an iPad app to obtain weather briefings and file flight plans.

An NTSB Meteorologist collected and compiled weather data into a factual report. The National Weather Service Surface Analysis Chart for 1600, about 1 hour before the accident, depicted the accident site east of a squall line. Ground based weather radar (WSR-88D) at Birmingham, Alabama and Jackson, Mississippi, depicted heavy precipitation associated with thunderstorms along the squall line. Specifically, at 1656, ground based radar showed the airplane had penetrated an area characterized by reflectivity values of 50 dBZ or greater (Level 5).

The XM WX Satellite Weather (Nexrad Composite) radar product, time stamped at 1650, depicted the airplane clear of precipitation. This product would have been presented to the pilot as being approximately 6 to 7 minutes old at the time of the accident. The next product was broadcast at 1656:05, time stamped 1655, and may have uploaded to the cockpit within seconds of the in-flight breakup. This product would have also depicted the airplane clear of precipitation and would have been presented to the pilot as being approximately 1 to 2 minutes old. The airplane was also equipped with a stormscope/strikefinder, which would have depicted real-time lightning information, but contained less detail than Nexrad Composite

weather radar.

George M Bryan Airport (STF), Starkville, Mississippi, was located about 24 miles north of the accident site. The recorded weather at STF, at 1655, was: wind from 240 degrees at 7 knots, gusting to 22 knots; visibility 4 miles in thunderstorms with heavy rain; scattered clouds at 1,100 feet; broken ceiling at 2,600 feet; broken ceiling at 4,000 feet; temperature 20 degrees C; dew point 18 degrees C; altimeter 29.79 inches of mercury.

[For more information, see "Meteorology Group Chairman's Factual Report" in the NTSB Public Docket.]

WRECKAGE AND IMPACT INFORMATION

The wreckage impacted a rural area near Macon, Mississippi, consisting of fields and wooded terrain. A debris path extended approximately 1.25 miles on a magnetic course about 300 degrees. Pieces of window seal and cabin roof, with a global positioning system receiver antenna, were located at the beginning of the debris path. The left wing, cabin door, vertical stabilizer, and right wing were located in a field along the first one-third of the debris path. The top rudder section, both ailerons, fuselage, right wingtip fuel tank and middle seats were located along the second one-third of the debris path, in a wooded area. The pilot's seat was located along the final one-third, with the debris path terminating at the engine and forward cockpit section, also resting in a wooded area.

The left wing was separated at the root and the left main landing gear remained retracted in the wing. The left wing outboard section also separated about 10 feet from the root. The left flap was intact and retracted, while the left aileron had separated. The left aileron was recovered about .4 mile northwest of the left wing. Its trim tab and bellcrank remained attached. The left aileron was ballooned from 14 inches to 54 inches from the aileron tip. The left wing top main spar bolt remained in place and was bent upward, consistent with a positive wing separation. The fuel cap remained secured and fuel remained in the left wing fuel tank. The aileron trim actuator rod extension measured 2.5 inches, which equated to an off-scale tab down position. Buckling was observed on the lower wing skin, in a crosshatch pattern.

The right wing front spar remained attached to the front carry through spar via the upper and lower spar bolts. The right main landing gear and right flap were intact and retracted. An approximate 1-foot section of right aileron remained attached to the right wing and no other sections of right aileron were recovered. The right wingtip exhibited compression damage at the leading edge and the wingtip fuel tank had separated. The fuel cap was secured and no fuel was in tank; however, blue staining and vegetation discoloration was noted near the fuel tank. The pilot's left seat track remained intact and the right seat track had separated. The adjustment (center) track separated at the third adjustment hole from the front.

The rudder separated from the vertical stabilizer. Vertical stabilizer leading edge compression damage was observed, which extended approximately 20 inches, consistent with wing contact.

The vertical stabilizer forward spar was buckled on the right side and bent aft, which the aft spar completely separated.

The main fuselage was crushed on the left side. The left horizontal stabilizer was bent aft and rotated 90 degrees. The left elevator had separated and was not recovered. The right horizontal stabilizer was bent up and aft. The right horizontal stabilizer exhibited leading edge impact marks, located 38 inches from the root. The right elevator inboard section remained attached and the outboard section separated 41 inches from the root. The right elevator trim actuator jackscrew measured 1.5 inches of extension, which equated to an approximate 10-degree tab down position. The rudder bellcrank, rudder torque tube, and 22 inches of rudder remained attached by rudder cables.

The engine remained attached to the firewall and the propeller remained attached to the engine. Both the engine and propeller were buried in mud. The instrument panel came to rest inverted and both control yokes separated. Some postcrash fire damage was noted. The bottom section of the instrument panel had been consumed by fire and the top section did not sustain fire damage.

The airplane's satellite weather information and stormscope/strikefinder information were both displayed on a Honeywell KMD-550 multi-function display unit. The airplane was also equipped with a JPI 700 engine monitor. The display unit and engine monitor were retained and forwarded to the NTSB Vehicle Recorder Laboratory, Washington, D.C., for data retrieval. The KMD-550 did not contain any non-volatile memory; however, radar data available to XM WX Satellite Weather subscribers surrounding the time of the accident was provided to an NTSB Meteorologist by the company that disseminates the information. Data from the JPI engine monitor was successfully downloaded and plotted. Review of the plot revealed that the exhaust gas temperatures were consisted with cruise engine power until the end of the data.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on June 1, 2012, by the State of Mississippi Office of the Chief Medical Examiner, Jackson, Mississippi.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. Review of the toxicology report revealed:

"… 0.097 (ug/ml, ug/g) Diphenhydramine detected in Blood
Diphenhydramine detected in Urine…"

Pilot Information

Certificate:	Private	**Age:**	53,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	February 23, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	258 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	HAWKER BEECHCRAFT	**Registration:**	N976S
Model/Series:	A36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Unknown	**Serial Number:**	E-3370
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 14, 2011 Annual	**Certified Max Gross Wt.:**	3650 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1337 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550
Registered Owner:	HARRISON GYPSUM LLC	**Rated Power:**	300 Horsepower
Operator:	Earl Shirley	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	STF,333 ft msl	**Distance from Accident Site:**	24 Nautical Miles
Observation Time:	16:55 Local	**Direction from Accident Site:**	350°
Lowest Cloud Condition:	Scattered / 1100 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 2600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / 22 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.79 inches Hg	**Temperature/Dew Point:**	20°C / 18°C
Precipitation and Obscuration:	Heavy - Thunderstorm - Rain		
Departure Point:	Clearwater, FL (PIE)	**Type of Flight Plan Filed:**	IFR
Destination:	Norman, OK (OUN)	**Type of Clearance:**	IFR
Departure Time:	15:15 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.110221,-88.559043(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Brandon Enea; FAA/FSDO; Jackson, MS Kris Wetherell; Hawker Beechcraft; Wichita, KS
Original Publish Date:	January 15, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=83818