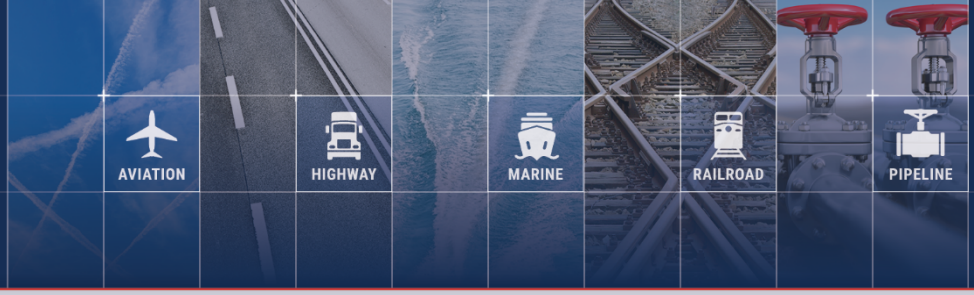

Aviation Investigation Final Report

Location:	JACKSONVILLE, Florida	**Accident Number:**	MIA93FA155
Date & Time:	July 14, 1993, 20:53 Local	**Registration:**	N2200Q
Aircraft:	BEECH 95-A55	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

SHORTLY AFTER LIFT-OFF, WITNESSES OBSERVED THE LEFT WING LEADING EDGE OUTBOARD OF THE ENGINE EXPLODE AND ERUPT IN FLAMES. THE AIRCRAFT IMMEDIATELY ROLLED TO THE LEFT AND CRASHED INVERTED. THE AIRCRAFT WAS CONSUMED BY FIRE. THE LEFT PITOT TUBE AND STRUCTUAL COMPONENTS FROM THE LEFT WING WERE FOUND ON THE RUNWAY BETWEEN 300 AND 600 FT FROM WHERE THE AIRCRAFT CAME TO REST. THE EXPLOSION OCCURRED IN THE LEFT WING LEADING EDGE FORWARD OF THE FRONT WING SPAR AND JUST AFT OF THE STALL WARNING SYSTEM VANE. THE TOP SPAR CAP WAS BENT UPWARD AND THE BOTTOM SPAR CAP WAS BENT DOWNWARD. THE SPAR CAPS WERE SEPARATED FROM THE SPAR WEBB. THE WING LEADING EDGE SHEET METAL WAS RIPPED OPEN AND CURLED AFT OVER AND BELOW THE WING. THE FUEL SYSTEM AND ELECTRICAL SYSTEM COMPONENTS IN THE AREA OF THE EXPLOSION HAD SUSTAINED MASSIVE FIRE DAMAGE.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: AN EXPLOSION AND FIRE FROM UNDETERMINED FUEL AND IGNITION SOURCES IN THE LEFT WING.

Findings

Occurrence #1: FIRE/EXPLOSION
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) FUEL SYSTEM - UNDETERMINED
2. (C) ELECTRICAL SYSTEM - UNDETERMINED
3. (C) WING - EXPLODED
4. (C) WING - FIRE

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
5. AIRCRAFT CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On July 14, 1993, at 2053 eastern daylight time, a Beech 95-A55, N2200Q, registered to B. C. Engineering, Inc., crashed during takeoff at Craig Airport, Jacksonville, Florida, while on a 14 CFR Part 91 business flight. Visual meteorological conditions prevailed at the time and an instrument flight rules flight plan was filed. The aircraft was destroyed and the private-rated pilot was fatally injured. The flight was originating at the time of the accident.

Witnesses reported hearing a loud "pop" or explosion and seeing N2200Q engulfed in flames at about 1100 feet into the takeoff on runway 14. The aircraft was about 5 feet off the ground at this time. The aircraft continued to climb and obtained an altitude of 25 and 50 feet. The aircraft then rolled to the left and crashed inverted on the left side of the runway.

PERSONNEL INFORMATION

Information on the pilot is contained under First Pilot Information.

AIRCRAFT INFORMATION

Information on the aircraft is contained under Aircraft Information.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. Meteorological information is contained under Weather Information.

WRECKAGE AND IMPACT INFORMATION

The aircraft crashed while departing runway 14 at the Craig Airport, Jacksonville, Florida. The aircraft came to rest inverted, 100 feet to the left side of runway 14, adjacent to a point 2,450 feet from the runway approach end. The aircraft wreckage was on about a 80-degree heading.

Structural components from the left wing leading edge and left wing tip were found on runway 14 beginning 1,800 feet from the approach end. The left wing pitot tube, a wing inspection panel, and a fuel vent line connector was found at the 1,900-foot point. None of these components had sustained fire damage.

Scrape marks were present on the left side of runway 14, 2,150 feet from the approach end.

The scrape marks angled about 60 degrees toward the east from runway center line. About 10 feet further two sets of cut marks began, 5 feet left and 5 feet right of the scrape marks. Both sets of cut marks ran parallel to the scrape marks and averaged 1 foot 3 inches between cuts. There were six cut marks on the left and nine cut marks on the right. The scrape marks continued toward the east and a runway light was knocked down in the path of the scrape marks. The marks continued into the grass area east of the runway and ended at the inverted wreckage of N2200Q.

All components of the aircraft necessary for flight were located on or around the main wreckage. Continuity of all flight control and engine control cables was confirmed.

Examination of the left engine and propeller indicated that the propeller separated from the engine during the crash sequence. The propeller was found 50 feet behind the aircraft wreckage. The engine rotated normally and continuity of the crankshaft, camshaft, valve train, and accessory drives was confirmed. Each cylinder produced compression. The left magneto produced spark and the engine driven fuel pump drive shaft had continuity. The engine fuel system had sustained fire damage. The fuel screen from the fuel metering unit was free of debris. The engine exhaust system showed no evidence of exhaust leakage. The left propeller blades were at a low pitch angle and each blade had extensive curling and damage from ground impact.

Examination of the right engine and propeller indicated that the right propeller separated from the engine during the crash sequence. The propeller was found adjacent to the engine and aircraft wreckage. The engine rotated normally and continuity of the crankshaft, camshaft, valve train, and accessory drives was confirmed. Each cylinder produced compression. The left magneto produced spark when the fire damaged condenser was replaced. The engine driven fuel pump drive shaft had continuity. The engine fuel metering unit inlet screen was free of debris. The engine fuel system had sustained fire damage. The engine exhaust system showed no evidence of exhaust leakage. The right propeller blades were at a low pitch angle and each blade had extensive curling and damage from ground impact.

Examination of the left wing leading edge revealed the leading edge skin was ripped open and bent aft on the bottom and top at a point 2 feet outboard from the engine nacelle. A large hole was present in the wing leading edge. The front spar cap was separated from the spar web and bent upward on the top and downward on the bottom. The spar web was pushed aft. The landing light assembly mounted near the wing tip structure had sustained damage and the wing tip had sustained damage. The complete wing had sustained massive fire damage.

The pitot tube and an inspection panel which was found on the runway 300 to 600 feet from the aircraft was normally located in the area of spar and leading edge damage 2 feet outboard of the engine nacelle. The pitot tube and inspection panel did not have any fire damage. The stall warning system vane mounted on the left wing leading edge in the area of the damage was in place on the wing skin. The auxiliary fuel tank fuel level sending unit wiring passed through the wing spar web in the area of the damage.

The left wing main fuel cell is mounted forward of the left wing front spar in the area aft of the engine nacelle. The fuel cell had sustained some fire damage. The fuel vent outlet and fuel return inlet to this fuel cell, which is located on the outboard end of the cell, were in place on the cell. The fuel vent line had continuity to the point it connected to the overboard vent fitting at the bottom side of the wing leading edge. The connector had pulled loose from the overboard vent fitting. The fuel return line had continuity for about 12 inches where fire had destroyed the remainder of the line. Pressure checking of the fuel vent and fuel return lines at the cell revealed no leakage from the lines under a 10 to 20 psi pressure. No evidence of fuel leakage from the main fuel tank was found.

The left wing auxiliary fuel tank was destroyed by the postcrash fire. All fuel return and fuel vent lines to this tank were damaged by fire. The fuel vent connector found on the runway could not be identified as to it's location in the left wing.

All electrical wiring located in the left wing leading edge area forward of the wing spar had sustained extensive fire damage.

MEDICAL AND PATHOLOGICAL INFORMATION

Postmortem examination of the pilot was conducted by Dr. Margarita Arruza, M. D., Associate Medical Examiner, Jacksonville, Florida. The pilot died as a result of craniocerebral injuries. Postmortem toxicology testing on specimens obtained from the pilot was performed by Dr. Arruza and Dr. Dennis V. Canfield, Ph. D., Manager Toxicology Laboratory, Federal Aviation Administration, Oklahoma City, Oklahoma. The tests were negative for ethanol alcohol, basic, acidic, and neutral drugs. The tests were positive for 6 percent carbon monoxide, .340 ug/ml cyanide, and a trace of caffeine. For additional medical and pathological information see supplement K to this report and the toxicology test reports attached to this report.

FIRE

Witnesses observed the left wing area outboard of the engine explode and erupt in fire shortly after the aircraft lifted off the runway. The fire continued to burn as the aircraft rolled inverted and crash on the side of the runway. The aircraft was consumed by fire after it came rest.

TESTS AND RESEARCH

Computations using a computer based program indicated that a 78 inch diameter, three blade propeller, similar to the propellers on N2200Q, would be rotating at 2700 rpm if the aircraft touched down at an estimated speed of 100 knots and the cut marks on the ground were 1 foot 3 inches apart. The takeoff propeller rpm for N2200Q is 2700 rpm.

METALLURGICAL EXAMINATION

Metallurgical examination of the left wing stall warning vane, and left wing forward spar web at the point the auxiliary fuel tank fuel level sending unit wiring passes through the spar web was examined by Frank P. Zakar, Materials Engineer, NTSB, Washington, D. C. No indications of any electrical arching was found. See attached Metallurgist's factual report.

ADDITIONAL INFORMATION

The aircraft wreckage was released on July 16, 1993 to B. C. Engineering, Inc., c/o Jeffrey Stutz, Northeast Florida Aircraft Maintenance, Inc., Craig Airport Hangar 12, Jacksonville, Florida.

Pilot Information

Certificate:	Private	**Age:**	35,Male
Airplane Rating(s):	Single-engine land; Multi-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 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	February 11, 1993
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	673 hours (Total, all aircraft), 478 hours (Total, this make and model), 483 hours (Pilot In Command, all aircraft), 82 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BEECH	**Registration:**	N2200Q
Model/Series:	95-A55 95-A55	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	TC457
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	September 28, 1992 Annual	**Certified Max Gross Wt.:**	4880 lbs
Time Since Last Inspection:	233 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	1830 Hrs	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-E
Registered Owner:	B. C. ENGINEERING, INC.	**Rated Power:**	285 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	CRG ,41 ft msl	**Distance from Accident Site:**	
Observation Time:	20:55 Local	**Direction from Accident Site:**	140°
Lowest Cloud Condition:	Scattered / 25000 ft AGL	**Visibility**	7 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	160°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	27°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	IFR
Destination:	PLANT CITY , FL (PCM)	**Type of Clearance:**	IFR
Departure Time:	20:53 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	CRAIG MUNICIPAL CRG	**Runway Surface Type:**	Asphalt
Airport Elevation:	41 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	4007 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	In-flight
Ground Injuries:	N/A	**Aircraft Explosion:**	In-flight
Total Injuries:	1 Fatal	**Latitude, Longitude:**	30.360591,-81.509681(est)

Administrative Information

Investigator In Charge (IIC):	Kennedy, Jeffrey
Additional Participating Persons:	GEORGE M HOLLINGSWORTH; MOBILE , AL EDDIE WEBBER; WICHITA , KS FRANK P ZAKAR; WASHINGTON , DC
Original Publish Date:	September 15, 1994
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=37345