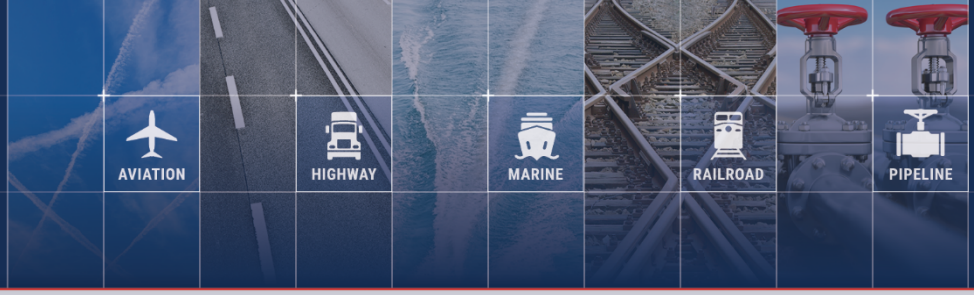

Aviation Investigation Final Report

Location:	WICHITA FALLS, Texas	**Accident Number:**	FTW94FA091
Date & Time:	March 3, 1994, 20:55 Local	**Registration:**	N474AR
Aircraft:	CESSNA 310K	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

THE AIRPLANE WAS AT AN IFR ASSIGNED ALTITUDE OF 8,000 FEET ON A DARK VMC NIGHT, WHEN ATC REPORTED THAT THEY WERE NO LONGER RECEIVING THEIR TRANSPONDER. THE PILOT ACKNOWLEDGED THAT THEY WERE EXPERIENCING ELECTRICAL PROBLEMS IN THE COCKPIT, BUT WERE TRYING TO WORK OUT THE SITUATION. A FEW MINUTES LATER THEY LOST RADAR CONTACT AS THE AIRPLANE INITIATED A DESCENT TOWARDS A NEARBY JOINT USE MILITARY-CIVILIAN AIRPORT SERVED BY APPROACH CONTROL RADAR. THE AIRPLANE WAS NOT IDENTIFIED BUT WAS TRACKED ON PRIMARY RADAR TO A POINT 2.8 MILES FROM THE AIRPORT. DURING THE LAST FEW MILES OF THE FLIGHT, THE AIRPLANE WAS HEADED WESTBOUND OVER SPARSELY POPULATED RURAL AREA THAT OFFERED MINIMAL OR NO VISUAL REFERENCE IN THE DARK NIGHT. WITNESSES IN THE AREA REPORTED HEARING THE SOUND OF AIRPLANE ENGINES FOLLOWED BY THE SOUND OF IMPACT. THE AIRPLANE IMPACTED THE GROUND INVERTED, WITH THE LANDING GEAR EXTENDED BY EMERGENCY MODE. THE LEFT GENERATOR WAS FOUND TO BE INOPERATIVE, AND THE GROUNDING WIRE FROM THE RIGHT VOLTAGE REGULATOR WAS FOUND TO HAVE A BURNED OUT TERMINAL END. THE PILOT RATED PASSENGER HAD A FLASH LIGHT IN HIS HAND.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: WAS THE LOSS OF CONTROL DUE TO THE PILOT'S SPATIAL DISORIENTATION FOLLOWING A COMPLETE ELECTRICAL SYSTEM FAILURE. FACTORS WERE THE DARK NIGHT AND THE ELECTRICAL FAILURE AS RESULT OF BURNED OUT WIRING TERMINAL.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: CRUISE - NORMAL

Findings
1. ELECTRICAL SYSTEM,GENERATOR - OVERLOAD
2. ELECTRICAL SYSTEM,ELECTRIC WIRING - SHORTED
3. ELECTRICAL SYSTEM,BATTERY - OUTPUT LOW
4. (F) ELECTRICAL SYSTEM - FAILURE,TOTAL
5. PRECAUTIONARY LANDING - INITIATED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. (F) LIGHT CONDITION - DARK NIGHT
7. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
8. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND

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

Factual Information

HISTORY OF FLIGHT

On March 3, 1994, at 2055 central standard time, a Cessna 310K, N474AR, was destroyed following a loss of control near Wichita Falls, Texas. The commercial pilot and his three passengers were fatally injured. Visual meteorological conditions prevailed for the personal flight.

The airplane departed the Addison Airport, near Dallas, Texas, at 2003 on an IFR flight plan to the Centennial Airport, near Denver, Colorado. At 2029, while in cruise flight at 8,000 feet, the pilot was advised by ATC that they were not receiving his transponder. The pilot replied that they would recycle the transponder. Two minutes later, ATC advised the pilot that they were still not receiving the transponder, and the pilot replied that they were experiencing electrical problems, the lights were dimming out, and "just bear with us, it's a rental airplane."

Radio communications were lost at 2034, when the airplane was reported crossing the Bridgeport VOR 039 degree radial, at 34 nautical miles (NM). Fort Worth Center lost radar contact with the airplane at 2040, when the airplane was 33 NM east of Wichita Falls, Texas.

Sheppard Air Force Base (AFB) Approach was contacted by Fort Worth Center and advised that N474AR was approaching Wichita Falls; however, they were never able to establish contact with the airplane.

The airplane was located by search and rescue personnel at 0230 the next morning in an open pasture, approximately 2.8 NM east of the Sheppard AFB/Wichita Falls Municipal Airport. During the last few miles of the flight, the airplane was headed west over sparsely populated rural area that offered minimal or no visual references in the dark night environmental conditions that prevailed.

There were no reported eyewitnesses to the accident; however, several residents in the immediate area of the accident reported hearing the sound of an airplane engine revving up the engines around the time of the accident, followed by the sound of impact.

PERSONNEL INFORMATION

The pilot started flying in October 1973. He obtained his instrument rating on September 1984, and his multi-engine rating on August 1988. He was initially checked out in the Cessna 310 on July 17, 1988. His last local check out in the Cessna 310 was on January 28, 1993, when he received 1.9 hours of instruction.

The right seat occupant was the pilot's younger brother. He was an instrument rated ASEL private pilot. He assisted the pilot with some of the radio transmissions during the flight. A flashlight was found in his left hand.

AIRCRAFT INFORMATION

A review of the airframe and engine records by the FAA inspector, did not reveal any anomalies or uncorrected maintenance defects prior to the flight. The baggage and personal gear for all the occupants accounted for 154 pounds, and based on weight and balance calculations performed, the airplane was within its limits at the time of the accident.

The emergency procedures card was found on the floor of the airplane between the pilot and copilot seats. A current approach plate, opened to the ILS approach for the Wichita Falls Airport was also found in the same area.

COMMUNICATIONS

The transcripts from all communications between the airplane and and all the pertinent Air Traffic Control (ATC) facilities are enclosed in this report.

WRECKAGE AND IMPACT INFORMATION

Ground scars and imprints made by the right engine, propeller, and wing tip tank were located on the left side of the initial point of impact on a measured heading of 175 degrees. Traces of the red navigational light lens were found on the right side of the initial point of impact. The magnetic compass, and most of the windshield plexiglass were found at the initial point of impact.

The wreckage came to rest in the upright position on a measured heading of 330 degrees. The landing gear was found in the extended position. The landing gear emergency extension handle was found out of the retaining clip with the handle fully engaged and locked.

Flight control continuity was established to the rudder, elevators, and ailerons.

Fuel was found in each of the wing auxiliary tanks. Both wing tip main tanks were destroyed by impact. The fuel selectors were found on their respective main tanks. According to the operator's records, the airplane was topped off with 4 gallons of 100LL Avgas prior to its departure from the Addison Airport.

Both engines were found separated from their respective mounts. Both propeller assemblies were found buried in the muddy ground at the initial point of impact, next to a pond. See wreckage diagram for details on the wreckage distribution pattern.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies and toxicological tests were ordered and performed. The autopsies were performed by Jeffrey J. Barnard, M.D, Chief Medical Examiner for the Southwestern Institute of Forensic Science, at Dallas, Texas, on March 5, 1994. Toxicological tests were negative.

TEST AND RESEARCH

A complete wreckage reconstruction and examination was accomplished on March 7, 1994. The two Concord CB-25 lead acid batteries were tested for output. The number one battery had a residual voltage of 1.8 volts while the number two battery had a residual voltage of 1.4 volts. Both batteries were placed on a battery charger for 30 minutes. Battery charging and retention were normal and no defects were observed.

A detailed examination of both engines was completed at the engine manufacturer's facility on April 21, 1994. Engine continuity was established on both engines. The ignition system was tested and the fuel injection system was flow tested. No discrepancies were found on either engine that would have prevented normal engine operation. A copy of the teardown report is enclosed.

Both generators, their respective voltage regulators, and the paralleling relay were tested at an FAA Repair Station on March 11, 1994.

The left generator (Part Number 1105057, Serial Number 27335R) exhibited signs of severe overheating. Signs of internal disintegration was evidenced by several large pieces of copper armature winding wire coming out when the inspection flange was removed. Additionally, evidence of solder being thrown into the generator case was found on the case. Due to the extent of the internal damage to the generator, the generator would not provide any electrical output. Aircraft records indicate that this generator was installed on January 19, 1994, with two other generators previously installed on October 28, 1993, and on June 21, 1993.

The right generator (Part Number 1105057, Serial Number 1030697) was tested on a test stand. Electrical output was found to be within limits and the generator was found operational; however, the electrical output dropped to zero anytime the grounding strap from the generator to the voltage regulator was disconnected. The aircraft grounding wire for the right voltage regulator was found to have a burned out terminal end.

Both voltage regulators were manufactured by Electrosystems Inc, under Part Number VR-300-28-50. Serial numbers for the voltage regulators were 3021595R for the left, and 21111538R for the right. No defects were noted in the operation of the regulators.

ADDITIONAL DATA

The wreckage was released to the owner's representative following conclusion of the field investigation.

Pilot Information

Certificate:	Commercial	**Age:**	41,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:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	July 23, 1992
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1204 hours (Total, all aircraft), 244 hours (Total, this make and model), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	**Registration:**	N474AR
Model/Series:	310K 310K	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310K0147
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 15, 1993 100 hour	**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:	91 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	5637 Hrs	**Engine Manufacturer:**	CONTINENTAL
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-470-V
Registered Owner:	WILSON, DAVID J.	**Rated Power:**	260 Horsepower
Operator:	ARI BEN AVIATOR INC.	**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:**	Night/dark
Observation Facility, Elevation:	SPS ,1015 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	01:56 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Scattered / 18000 ft AGL	**Visibility**	25 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	14°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	DALLAS , TX (ADS)	**Type of Flight Plan Filed:**	IFR
Destination:	DENVER , CO (APA)	**Type of Clearance:**	IFR
Departure Time:	20:05 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	33.889907,-98.509445(est)

Administrative Information

Investigator In Charge (IIC):	Casanova, Hector
Additional Participating Persons:	LOUIS E VARGO; FORT WORTH , TX
Original Publish Date:	November 14, 1994
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=18884