Aircraft Mishap Report
Cessna Aircraft Company

Cessna
A Textron Company

Year: 1977; Model: 421C

Serial Number: 421C0305; Registration Number: N421LL

Mishap Location: Concord, NC; Date: 6/14/99; Time: 1257 EDT

Registered Owner: David Drye Company
170 Davidson Highway
Concord, NC 28027

Operator: Same as registered owner

Cessna Investigator: William B. Welch
Cessna Report Number: 99-ASBL
Report Date: 12/12/99
Investigator's Signature:

NTSB Investigator: J. Kennedy
NTSB Report Number: MIA99FA180
Party Status: Yes

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Summary of Investigation

The subject aircraft had just departed Runway 20 at Concord Regional Airport, Concord, NC, when the pilot radioed back that he had a problem with the aircraft's right engine. The Concord tower gave him clearance to return to the airport. The tower personnel watched the aircraft make a shallow right bank toward the airport, level off and then descend beyond the tree line. The pilot then radioed "don't think we're going to make it." The aircraft impacted terrain approximately 30" right wing low and 1 1/2 miles from the airport on a heading of 245". The aircraft came to rest inverted and was consumed in a post-impact fire. The pilot and the three passengers received fatal injuries in the mishap. The aircraft had departed earlier that morning from Lincolnton, NC, where the main fuel tanks had been topped off with 151.3 gallons. The pilot was to pick the passengers up at Concord and then fly them to Anderson, SC. There was no flight plan filed and the weather was VFR.

The on-site investigation showed that the entire aircraft with the exception of the empennage had been destroyed by the post-impact fire. The left and right engines were found in the general vicinity of the wing attach points. Both engines showed no external damage other than fire. The left propeller had separated from the engine during the impact and the right propeller was found still attached to the engine, however, one blade had separated from the hub. Neither the left or right propeller showed signs of being feathered. Both the landing gear and flaps were found in the retracted position. The engines, propellers and turbochargers were sent back to their respective manufacturers for teardown and inspection. The engines showed one pre-impact discrepancy and that was a "wallowed" out crankcase needle bearing bore for the starter shaft gear on the right engine. No discrepancies were noted with the turbochargers and propellers

Narrative

History of Flight

The subject aircraft had departed earlier the morning of the mishap from Lincolnton, North Carolina (23 nm from Concord), where the main fuel tanks had been topped off with 151.3 gallons. Other pre-flight activities of the pilot in reference to the subject aircraft were not obtained by this investigator.

The pilot was to pick the passengers up at Concord and then fly them to Anderson, South Carolina. There was no flight plan filed for the flight from Concord to Anderson and the weather was VFR. The commercial certificated pilot flew for a Part 135 operation as his regular occupation, but also flew the Dryes (owner's) aircraft on a part-time basis.

The subject aircraft was in the process of departing Runway 20 at Concord Regional Airport, Concord, North Carolina, when the pilot radioed back that he had a problem with the aircraft's right engine. The Concord tower gave him clearance to return to the airport and the tower personnel watched the aircraft make a shallow right bank toward the airport, level off and then descend beyond the tree line. The pilot then radioed that they were "going in" and to call for the equipment. The aircraft impacted terrain approximately 30° right wing low and 1 1/2 miles from the airport on a heading of 245". The aircraft came to rest inverted and was consumed in a post-impact fire. The pilot and the three passengers received fatal injuries in the mishap.

Pilot Information

The commercial pilot (ASEL), Kelly A. Ward, also held multi-engine and instrument ratings. According to the NTSB he had a total flight time of 7360.0 hours with 900.0 hours in make and model. He was flying on a current second class medical with no limitations.

Medical and Injury Information

According to the NTSB all occupants received their fatal injuries through carbon monoxide and fire. The pilot, Kelly A. Ward, showed a 34% carboxyhemoglobin level in the toxicology report. The pilot also tested negative for drugs and alcohol.

Aircraft Information

The 1977 Cessna 421C, N421LL, was owned and operated by the David Drye Company of Concord, North Carolina. The aircraft total airframe time was not obtained due to the post-impact fire. But the airframe total time at the last annual inspection was 4909.1 hours, and this inspection was completed on September 3, 1998. Both the left and right engines had 845.1 hours **SMOH** at the time of the last annual inspection. The aircraft had been modified by the RAM Aircraft Corporation of Waco, Texas, through numerous STC's. See attachment #3 for airframe and engine logbook entries.

Witnesses

The tower controller, Robert C. Rice, gave the following statement to the FAA:

"N421LL, taxied to Runway 20 for a VFR departure. I cleared him for take off. I observed the aircraft lift off at approximately 1,000 foot remaining marker. Shortly after take off N421LL said he has a right engine failure. I notified 911 and cleared N421LL to land. N421LL was observed to level off his climb and continued straight ahead, appeared to lose altitude, declared he was not going to make it. He

repeated the statement, lost altitude, disappeared behind the mall, I lost radio contact, observed black smoke. I informed 91I with no further contact."

Weather Information

The weather conditions three minutes prior to the mishap and 13 nm to the southwest at Charlotte, NC were: winds variable at 6 knots, visibility was 10 statute miles with scattered clouds at 4500 feet. The temperature was 29°C (84°F) and the dew point was 19°C (66°F) with an altimeter setting of 30.04 inHg.

Airframe Examination

Fuselaae: The on-site investigation showed that the entire aircraft with the exception of the empennage had been destroyed by the post-impact fire. The left and right engines were found in the general vicinity of the wing attach points. Both engines showed no external damage other than fire. The left propeller had separated from the engine during the impact and the right propeller was found still attached to the engine, however, one blade had separated from the hub. Neither the left or right propeller showed signs of being feathered. Both the landing gear and flaps were found in the retracted position. The Left fuel selector valve was in the main left tank position.

Flight Controls and Aerodynamic Surfaces: The flight control cables were verified for continuity from the control attach point to the flight deck control yoke or rudder pedal attach points. All primary and secondary control surfaces were documented on-site. The left and right wings were consumed by fire, with the empennage surfaces showing partial consumption by the post-impact fire.

Seats/Restraint Systems/Cabin Environment: The cabin's structural integrity post-impact was not determined due to the post-mishap fire and subsequent disruption of the wreckage by responding emergency crews. There were unidentified seat frames that survived the post-mishap fire, but their location in the aircraft could not be determined due to the disruption of the wreckage by responding emergency crews. All restraint systems were consumed by the fire.

Fuel System: The fuel system was completely compromised by the post-mishap fire.

Power Plant Examination: Both the left engine (GTSIO-520-NCL, S/N: 265007-R) and right engine (GTSIO-520-L, S/N: 604701) were torn down and examined at Teledyne Continental Motors (TCM) in Mobile, Alabama, on July 13, 1999. According to Fred Fihe of TCM the left engine exhibited normal operational signatures throughout, except for the fire and impact damage. All internal components appeared well lubricated. The engine did not exhibit any condition that would have caused an operational problem. The right engine exhibited normal operational signatures, except for the fire and impact damages and the wallowed crankcase needle bearing bore for the starter shaft gear. All internal components appeared to be well lubricated. This engine did not exhibit any condition at the time of teardown that would have caused an operational problem.

Both the left and right turbochargers were torn down and examined at AlliedSignal Aerospace in Phoenix, Arizona, on August 11, 1999. According to Phillip Hensley, both the left and right turbochargers showed damage due to impact forces and exposure to fire. There was no evidence of turbocharger rotation at the time of impact. No pre-impact conditions were found which would have interfered with normal operation of either turbocharger wastegate.

Both the left and right propellers were torn down and examined at McCauley Propeller Systems in Vandalia, Ohio on July 27, 1999. According to Tom Knopp, as a result of his examination the following conclusions were drawn:

1. Propeller damage was a result of impact. There were no indications of any type of propeller failure prior to impact.
2. Both propellers were rotating at impact. Neither propeller was at or near the feather position at impact.
3. Exact amount of power being absorbed by each propeller was not determined.
4. Propeller damage for both propellers was very similar indicating equivalent energy at impact.
5. Both propellers were operating at or near low pitch range at impact.

Mishap Site Information

Location: Off Airport
Elevation: 690' Ft. MSL
Latitude: N 35'21.1 ' (GPS)
Longitude: W 080º44.5' (GPS)
Obstacles Struck Before Principal Impact:
Trees

Terrain Features: Rolling Wooded
Terrain Conditions: Hard Dry
Light Conditions: Day

Flight Path:
Magnetic Heading: 245º
Vertical Angle: N/Oº

Approx. Attitude at Impact:
Pitch: N/Oº Yaw: N/Oº
Roll: N/Oº

245"

380'		←Main wreckage (inverted lying on a heading of 350")
300'		←left propeller
	Tree cut by propeller+	
		←Various debris
	Right wing tip→	
200'		
100'		
		← Initial impact with 60' tree

NOT TO SCALE

Crew Information

Seat: 1 Name: Kelly A. Ward DOB: [redacted] Status: Pilot-In-Command
Address: 724 Airport Road, Iron Station, NC 28080
Certificate Information: Medical Certificate Information:
Commercial Airplane SEL Instrument Class: II Date Issued: 7/8/98
MEL Limitations:
None
Number: [redacted] Date Issued: 12/29/82

Injury Severity: Fatal Toxicology Performed? Yes Autopsy Performed? Yes

Flight Time Source(s) of Information: NTSB FAA

Total Time:	7360	SE:		PIC:	
Actual Instrument:		ME:		Dual:	
Simul. Instrument:		This Model:	900	Last 30 Days:	
Day:		Night:		Last Flt. Review:	3/29/99

Seat: Name: DOB: Status:
Address:
Certificate Information: Medical Certificate Information:
Class: Date Issued:
Limitations:
Number: Date Issued:

Injury Severity: Toxicology Performed? Autopsy Performed?

Flight Time Source(s) of Information:

Total Time:		SE:		PIC:	
Actual Instrument:		ME:		Dual:	
Simul. Instrument:		This Model:		Last 30 Days:	
Day:		Night:		Last Flt. Review:	

Seat	Name	Address	Status	Age	Injury
2	David Drye, Sr.	850 Williams Run Court Concord, NC	Passenger	57	Fatal
3	Ann M. Drye	850 Williams Run Court Concord, NC	Passenger	N/O	Fatal
4	Mark Carlson	Concord, NC	Passenger	30	Fatal

Flight Data

Type of Flight: Cross Country PIC | Flight Plan Filed? No
Purpose: Pleasure | Type of Flight Plan:
Departure Point: Concord, NC | Date: 6/14/99 | Time: 1255 EDT
Destination: Anderson, SC | ETA: N/O | ETE: N/O
Routing: Unk | Altitude: Unk' MSL
Weather Briefing Prior to Takeoff? Unk | Method Of Briefing: | After Takeoff? Unk

Last Known Fueling Location: Lincolnton, NC | Date: 6/14/99
Amount of Fuel Added: 151.3 | Type of Fuel Added: 100LL
Amount of Fuel at Takeoff: Unk | Estimated Amount of Fuel at Occurrence: Unk

Center of Gravity Within Limits? At Takeoff: * Inches
At Occurrence: * Inches
Gross Weight Within Limits? At Takeoff: * Pounds
At Occurrence: Pounds
Number and Description of Cargo Items: Unknown
Aircraft Weight According to Aircraft Paperwork: * No data Pounds Arm: Inches

Aircraft Data

Initial Delivery Date: 5/23/77 | Date Purchased by Current Owner: 12/7/98
Total Time at Occurrence: N/O
Date of Last Annual: 9/3/98 | Date of Last 100-hour:
Hours at Last Annual: 4909.1 | Hours at Last 100-hour:
Last Pitot/Static Check:
Flight Manual On Board? Unk | Aircraft Logbooks On Board? No
Source(s) of Information: NTSB FAA Other Logbook
Modifications and STC's:
SA3721SW, SA5981SW, SE4591SW, SA4592SW, SA5878SW, SE3767SW, SE8338SW
See attachment #3 for details on STC's

Power Plant Data

	Manufacturer:	Model:	Serial Number:	Total Time:	TTSMO:
Engine #1	Continental	GTSIO-520-L	604701	4279.9	845.1
Engine #2	Continental	GTSIO-520-L	265007-R	N/O	845.1
Propeller #1	McCauley	3FF32C501-C	982505	N/O	N/O
Propeller #2	McCauley	3FF32C501-A	803237	N/O	N/O

Propeller #1 Blade Serial Numbers:	Blade #1	SF005	Blade #2	SE040
	Blade #3	SF066		
Propeller #2 Blade Serial Numbers:	Blade #1	K70753	Blade #2	K70810
	Blade #3	K70870		

Weather Data

Weather at Nearest Reporting Point

Location: Charlotte, NC (KCLT) 13nm southwest of mishap Time: 1254 EDT
Wind Direction: Variable' Wind Velocity: 6 knots Visibility: 10 sm
Significant Weather: None Cloud Cover: Scattered 4500
Temperature: 29 °C Dew Point: 19 °C Altimeter Setting: 30.04 In.Hg
Remarks:

Estimated Weather at Accident Site Same as Above

Wind Direction: ° Wind Velocity: Visibility:
Significant Weather: Cloud Cover:
Temperature: °C Dew Point: °C Altimeter Setting: In.Hg
Remarks:
Mishap Site Weather Data Source:

Wreckage Documentation

Seats

Seat#	Seat Feet Intact?	Seat Back Intact?	Seat Base Intact?	Seat Rail Intact?
1	No	No	No	No
3	No	No	No	No
4	No	No	No	No
7	No	No	No	No

Lap Belts			Shoulder Harnesses		
Seat #	Used?	Intact?	Installed?	Used?	Intact?
1	Unk	No	Unk	Unk	
3	Unk	No	Unk	Unk	
4	Unk	No	Unk	Unk	
7	Unk	No	Unk	Unk	

Seat #	Occupied?	Seat Orientation?	Comments
1	Yes	Forward Facing	
3	Yes	Aft Facing	
4	Yes	Aft Facing	
7	Yes	Forward Facing	

Nose Wheel	x	
Left Main	x	
Right Main	x	
Gear Selector		
Gear Actuator(s)		

Flap Positions

Flap Actuator	Up
Flap Indicator	N/O
Flap Selector	N/O
Left Flap	N/O
Right Flap	N/O

Trim Tab Positions

Aileron Tab	5° tab down
Rudder Tab	5° tab right
Elevator Tab	Neutral
Aileron Indicator	
Rudder Indicator	
Elevator Indicator	

Flight Control Continuity

	Established?
Ailerons	Yes
Rudder	Yes
Elevator	Yes
Flaps	Yes
Aileron Tab	Yes
Rudder Tab	Yes
Elevator Tab	Yes

Pressurization Controls

Cabin VSI	D
Cabin Altitude	D
Differential Pressure	D
Pressurization Safety Valve	D
Pressurization Dump Valve	D
Source Selector Knob	D

Fuel Management

	Position Left	Right
Fuel Quantity Gauge Selector		
Fuel Selector Handle	N/O	N/O
Fuel Selector Valve	Main	N/O
Fuel Boost Pump	N/O	N/O
	Left Side	Right Side
Fuel Gage Reading (Main)	D	D
Fuel Gaae Reading (Aux.)		

Emergency Locator Transmitter Information

ELT Installed	N/O
ELT Type	
ELT Serial Number	
ELT Battery Due Date	
ELT Armed?	

Dual Controls Installed?	Yes
Oxygen Installed?	Yes
Alternate Static Source	

Certified into Known Icing?	Unk
De-Ice Boots Installed?	

	On	Off
Surface De-Ice		
Surface Anti-Ice		
Windshield De-Ice		
Windshield Anti-Ice		

Cabin Heater	Unk	
Air Conditioner	Unk	
Cabin Vent	Unk	
Defrost Control	Unk	

Flight Instruments

	Single	Right
Airspeed Indicator	D	D
Altimeter	D	D
Altimeter Setting	D	D
Heading Indicator		
Heading Bug	D	D
Vertical Speed Indicator	D	D
Attitude Indicator (pitch)	D	
Attitude Indicator (roll)	D	
Turn Coordinator (Airplane)		
Turn Coordinator (Ball)		
Magnetic Compass		
NAV #1 OBS	D	
NAV #2 OBS	D	
RNAV Bearing		
RNAV Distance		
Clock	D	

Communication and Navigational Aids

	On	Off	Freq
COM #1	Unk		
COM #2	Unk		
NAV #1	Unk		
NAV #2	Unk		
DME			
RNAV	Unk		

	On	Off	Freq	Mode
Loran				
GPS				
Loran				
GPS				

	Unk			
Transponder	Unk			

Engine Instruments

	Engine #1	Engine #2
Hourmeter	D	
Tachometer - RPM	D	D
Manifold Pressure	D	D
Cylinder Head Temp.	D	D
Oil Pressure	D	D
Oil Temperature	D	D
Fuel Pressure		
Exhaust Gas Temperature	D	D
Ammeter	D	
Voltmeter	D	
Instrument Suction Gage	D	
Fuel Flow	D	D
Torquemeter		
N1 Tachometer		
N2 Tachometer		

	On	Off
Master Switch	Unk	
Avionics Switch #1	Unk	
Avionics Switch #2		
Inverter Switch #1		
Inverter Switch #2		
Pitot Heat	Unk	
Navigation Lights	Unk	
Rotating Beacon(s)	Unk	
Landing Light(s)	Unk	
Taxi Light(s)	Unk	
Strobe Light(s)	Unk	
Instrument Lights	Unk	
Stall Heat		

Left Magneto	Unk		Unk	
Right Magneto	Unk		Unk	
Ignition				
Alternator/Generator				

Optional/Owner installed avionics and systems

	On	Off

Engine Control Positions (Cockpit)

	Engine #1	Engine #2
Throttle	Idle	Forward
Emer. Power Lever		
Mixture Control	Forward	Forward
Fuel Cond. Lever		
Propeller Control	Forward	Forward
Cowl Flaps		
Carburetor Heat		
Primer		
Inertial Separator		
	On / Off	On / Off
Prop. Sync/Phase		
Autofeather		

Engine Control Positions (Engine)

	Engine #1
Throttle	
Emer. Power Lever	
Mixture Control	
Fuel Cond. Lever	
Propeller Control	
Cowl Flaps	
Carburetor Heat	
Primer	
Inertial Separator	

Aircraft Wreckage Disposition

Engine #1	Observed
Engine #2	Observed
Propeller #1	Observed
Propeller #2	Observed
Fuselage	Consumed by Fire
Wing Center Section	Consumed by Fire
Tailcone	Consumed by Fire
Left Wing	Consumed by Fire
Right Wing	Consumed by Fire
Left Flap	Consumed by Fire
Right Flap	Consumed by Fire
Left Aileron	Consumed by Fire
Right Aileron	Consumed by Fire
Left Horizontal Stabilizer	Observed
Right Horizontal Stabilizer	Observed
Left Elevator	Observed
Right Elevator	Observed
Vertical Stabilizer	Observed
Rudder	Observed
Aileron Tab	Consumed by Fire
Rudder Tab	Observed
Elevator Tab	Observed
Left Main Gear	Consumed by Fire
Right Main Gear	Consumed by Fire
Nose Wheel	Consumed by Fire

The following are the definitions of the words used in the Aircraft Wreckage Disposition:

Not Located:	The part was not located
Not Retrieved:	The part was located but was not, or could not be retrieved
Consumed By Fire:	The part sustained fire damage, consuming all or part of it
Observed:	The part was located, partially or completely retrieved, and observed by a member of the investigating party

The following abbreviations are used in this report:

Unk	Unknown
N/A	Not Applicable
N/O	Not Obtained
N/R	Not Reliable
Digi	Digital Display

Participants

Name and Address	Telephone	Organization
Jeffrey L. Kennedy Miami, FL 33166	[redacted]	National Transportation Safety Board
Don Garrett Charlotte, NC 28208	[redacted]	Federal Aviation Administration
George M. Hollingsworth Reston, VA 22090	[redacted]	Teledyne Continental Motors
William B. Welch Wichita, KS 67277	[redacted]	Cessna Aircraft Company

Insurance: Not obtained

Salvage: Not obtained

Attachments

1 Map of mishap site
2 Concord tower transcript and statement
3 Aircraft logbooks (partial)
4 Cessna Aircraft Company original aircraft delivery documents
5 Photograph log
6 Photographs