National Transportation Safety Board

FACTUAL REPORT

NTSB ID: CEN14FA306
Occurrence Date: 06/20/2014
Aircraft Registration Number: N135BB
Most Critical Injury: Fatal
Occurrence Type: Accident
Investigated By: NTSB

Location/Time

Nearest City/Place: Sauk Rapids
State: MN
Zip Code: 56379
Local Time: 2029
Time Zone: CDT

Airport Proximity: Off Airport/Airstrip
Distance From Landing Facility: 6

Aircraft Information Summary

Aircraft Manufacturer: BRUMWELL
Model/Series: RV-6
Type of Aircraft: Airplane

Revenue Sightseeing Flight: No
Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On June 20, 2014, about 2029 central daylight time, an experimental amateur-built Brumwell RV-6, N135BB, impacted a house after a departure from cruise flight near Sauk Rapids, Minnesota, and about 6 miles northwest of the St Cloud Regional Airport (STC), St Cloud, Minnesota. The pilot and passenger were fatally injured. The airplane was destroyed by post-crash fire. The airplane was registered to and operated by the pilot under 14 CFR Part 91 as a personal flight and was not operating on a flight plan. Visual meteorological conditions prevailed at the time of the accident. The local flight originated from STC about 2010.

According to a transcript of STC Air Traffic Control Tower (ATC) communications, the pilot contacted STC ATC about 2011 and transmitted an initial departure heading of west/southwest.

About 2012, ATC cleared the airplane for takeoff from runway 13 and a turn to the west/southwest.

About 2016, the pilot transmitted that it would maneuver over the western part of town, then fly up the river, and contact ATC when inbound. The pilot transmitted the flight was an aerial tour of the city for the passenger aboard.

About 2017, ATC transmitted that an Airbus 319 [Allegiant Flight 108 (AAY108)] was 30 miles southwest of the airport and was inbound. The pilot transmitted, "I'll look for allegiant..."

About 2023, AAY108 transmitted that it was on a right base for runway 13. ATC then cleared AAY108 to land on runway 13. The pilot transmitted that they were over the river, by the hospital at 2,000 feet. The pilot then transmitted, "ah where's the airbus right now." AAY108 transmitted that it was 11 miles southwest of the airport.

About 2024, ATC and the pilot transmitted that they had AAY108 in sight. The pilot then transmitted, "and allegiant one three five bravo bravo i'm an r v six about your 12 o'clock position right over the river at two thousand feet." AAY108 transmitted that it had the airplane on its traffic collision avoidance system (TCAS) and was currently descending through 3,300 feet. The pilot transmitted, "yeah we'll keep comms with you plenty of room to maneuver there."

About 2025, the pilot transmitted, "I got a camera out we're gonna take a picture of ya." AAY108 transmitted, "we have you in sight as well."
There were no further transmissions from the airplane.

A witness near the accident site stated seeing a jet flying east and a small airplane flying north. The small airplane started "wobbling and shaking" and then started "going down." The small airplane was offset from the jet about 45 degrees from the tail of the jet. The witness stated that the small airplane may have been at a higher altitude than the jet. The small airplane's wings were "rocking back and forth" before the "nose went down." The witness stated seeing a dark and a light colored object come from the small airplane.

Another witness stated that he was sitting and facing east in his house's driveway. He looked south when he heard engine noise from the accident airplane. He said the airplane was in a "nose-dive." He said that the airplane was heading north. The airplane had about a 70 degree nose down attitude while in the descent. He said there was no fire from the airplane. The airplane was not rotating while it was descending. He said the winds were from the south and that there was "not a lot of wind."

OTHER DAMAGE

The home that was struck by the airplane sustained impact and fire damage.

PERSONNEL INFORMATION

The pilot, age 60, was employed as captain on Boeing 737 airplanes at an air carrier. He held an airline transport pilot certificate with airplane multiengine land, airplane single-engine land, airplane single-engine sea ratings. He held Boeing 727 and Boeing 737 type ratings. He held a flight instructor certificate with airplane single-engine and instrument airplane ratings. He held a flight engineer certificate with a turbojet powered rating.

A pilot logbook recovered from the wreckage had a beginning entry dated April 2013 with a tachometer time entry of 1,324.7 hours and the last entry was dated June 2014 with a tachometer time entry of 1,383.2 hours. All the pilot logbook were entries for the accident airplane.

The pilot's flight experience included 24,465 total hours, of which 478 hours were in the last six months as of his last airman medical examination dated January 23, 2014. The pilot was issued a first class airman medical certificate with the following limitation: must wear corrective lenses.

AIRCRAFT INFORMATION

The airplane was a 1992 Brumwell RV-6, serial number 20598, experimental amateur-built airplane that was powered by a Lycoming O-360-A1A, serial number L-33015-36A, engine. The airplane was built by the previous owner/builder. The airplane was equipped with an upward (tip-up) opening canopy.

On December 19, 2012, the pilot purchased the airplane from the aircraft builder. On March 5, 2013, the airplane's registration to the pilot was accepted by the Federal Aviation Administration.

On January 6, 2013, at a total time in service and a tachometer time of 1,305.9 hours, the last aircraft logbook entry made by the previous owner/builder was for a pre-sale checkout of the airplane, which "checked ok."

The pilot logbook that was recovered from the wreckage had an entry dated August 24, 2013, for a flight in the accident airplane from JKJ [Moorhead Municipal Airport, Moorhead, Minnesota] to STC. The remarks section of this entry contained "canopy opened descending @ 120 kts STC" at a tachometer time of 1,359.6 hours. A review of the airframe logbook did not reveal a corresponding entry relating to the August 24, 2013, pilot logbook entry.
On April 14, 2014, at a total time in service and a tachometer time of 1,373 hours, an aircraft and engine logbook entries indicated that a condition inspection was completed and that the airplane and engine were found to be in a condition for safe operation. The entries were signed by an airframe and power plant mechanic. There were no additional aircraft logbook entries dated after April 14, 2014.

FLIGHT RECORDERS

There was no nonvolatile memory that could provide airplane position and time information due to the airplane's type of avionics installation and damage from the accident. There was no radar data available for the airplane. The flight data recorder from AAY108 was downloaded by the National Transportation Safety Board Vehicle Recorders Laboratory. The download included parameters of airplane position, altitude, speed, and configuration.

A plot of AAY108's flight track was produced by a National Transportation Safety Board Senior Air Traffic Investigator and is included in the docket of the report.

WRECKAGE AND IMPACT INFORMATION

The airplane was consumed by post-crash fire and by the fire of the home that the airplane impacted. The damage precluded functional testing and examination of the airplane systems. The canopy and its latching mechanisms were consumed by fire and could not be examined.

A headset case that contained an aviation headset and white PVC material were found at a neighboring house near the accident site. The pilot's name was on materials within the headset case. The headset and PVC material did not exhibit thermal damage or soot. PVC material has been used by builders of homebuilt airplanes for wheel chocks or control locks.

MEDICAL INFORMATION

An autopsy of the pilot was conducted by the Midwest Medical Examiner's Office, Ramsey, Minnesota, on June 21, 2014. The autopsy report stated the cause of death as multiple blunt force injuries due to plane crash.

The FAA's Final Forensic Toxicology Fatal Accident Report of the pilot stated that testing for carbon monoxide and cyanide were not performed, no ethanol was detected in the muscle and the liver, and no listed drugs were detected the in liver.

TESTS AND RESEARCH

The effects of wake turbulence, if any, could not be determined without relative position and time information from radar/recorded data for both airplanes.

The Lancair Legacy Canopy Safety Issue (Thorn 2014) discusses accidents resulting from flight with the upward opening canopies that become unlatched/open in flight for Lancair and not RV airplanes, which also have upward opening canopies. The paper states in part:

"There are several potential root causes of the Legacy's open canopy flight hazard. One is the canopy is large and, if not latched down in flight, it will open to varying degrees and alter the air flow over the tail/stabilizers and under some situations create significant pitch attitude stability and control issues.

Another potential root cause may be the pilot's loss of reliable airplane pitch attitude reference where the canopy's structural frame serves as a key attitude reference line and as the open canopy moves it corrupts the pilot's normal visual pitch attitude reference cues."
There may also be a tendency for pilots flying with the shock and chaos of an open canopy, with severe cockpit wind, noise, and debris flying about, to induce pitch attitude oscillations by their control inputs."

Updated on Feb 13 2015 3:59PM
## Landing Facility/Approach Information

<table>
<thead>
<tr>
<th>Airport Name</th>
<th>Airport ID</th>
<th>Airport Elevation</th>
<th>Runway Used</th>
<th>Runway Length</th>
<th>Runway Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Cloud Regional Airport</td>
<td>STC</td>
<td>1031 ft. MSL</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Runway Surface Type: Not Applicable
- Runway Surface Condition:
- Approach/Arrival Flown: NONE
- VFR Approach/Landing: None

## Aircraft Information

<table>
<thead>
<tr>
<th>Aircraft Manufacturer</th>
<th>Model/Series</th>
<th>Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRUMWELL</td>
<td>RV-6</td>
<td>20598</td>
</tr>
</tbody>
</table>

- Airworthiness Certificate(s): Experimental (Special)

## Aircraft Inspection Information

- Type of Last Inspection: Conditional
- Date of Last Inspection: 04/2014
- Time Since Last Inspection: 10 Hours
- Airframe Total Time: 1383 Hours
- Engine Type: Reciprocating
- Engine Manufacturer: Lycoming
- Model/Series: O-360-A1A
- Rated Power: 180 HP

## Emergency Locator Transmitter (ELT) Information

- ELT Installed?/Type: ELT Installed? None
- ELT Aided in Locating Accident Site? None

## Owner/Operator Information

- Registered Aircraft Owner: St Cloud, MN, 56304
- Operator of Aircraft: St Cloud, MN, 56304
- Pilot: St Cloud, MN, 56304
- Operator Does Business As: None
- Type of U.S. Certificate(s) Held: None
- Air Carrier Operating Certificate(s): None
- Operating Certificate: None
- Regulation Flight Conducted Under: Part 91: General Aviation
- Type of Flight Operation Conducted: Personal
## First Pilot Information

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
<th>State</th>
<th>Date of Birth</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>On File</td>
<td>On File</td>
<td>On File</td>
<td>On File</td>
<td>60</td>
</tr>
</tbody>
</table>

Sex: | Seat Occupied: | Occupational Pilot? | Yes | Certificate Number: On File |
<table>
<thead>
<tr>
<th></th>
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</tbody>
</table>

Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-engine Land; Single-engine Sea

Rotorcraft/Glider/LTA: None

Instrument Rating(s): None

Instructor Rating(s): Airplane Single-engine; Instrument Airplane

Current Biennial Flight Review?

Medical Cert.: Class 1

Medical Cert. Status: With Waivers/Limitations

Date of Last Medical Exam: 01/2014

### - Flight Time Matrix

<table>
<thead>
<tr>
<th>All A/C</th>
<th>This Make and Model</th>
<th>Airplane Single Engine</th>
<th>Airplane Multi-Engine</th>
<th>Night</th>
<th>Actual</th>
<th>Simulated</th>
<th>Rotorcraft</th>
<th>Glider</th>
<th>Lighter Than Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Time</td>
<td>24465</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pilot In Command (PIC)

Instructor

Instruction Received

Last 90 Days

Last 30 Days

Last 24 Hours

Seatbelt Used? | Shoulder Harness Used? | Toxicology Performed? | Yes |
<table>
<thead>
<tr>
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</tbody>
</table>

### Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point: St Cloud

State: MN

Airport Identifier: STC

Departure Time: 2010

Time Zone: CDT

Destination

Local Flight

State: MN

Airport Identifier: STC

Type of Clearance: None

Type of Airspace:

Weather Information

Pilot's Source of Wx Information:

Unknown
Weather Information

<table>
<thead>
<tr>
<th>WOF ID</th>
<th>Observation Time</th>
<th>Time Zone</th>
<th>WOF Elevation</th>
<th>WOF Distance From Accident Site</th>
<th>Direction From Accident Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>STC</td>
<td>2053</td>
<td>CDT</td>
<td>1031 Ft. MSL</td>
<td>6 NM</td>
<td>131 Deg. Mag.</td>
</tr>
</tbody>
</table>

Sky/Lowest Cloud Condition: Clear

Lowest Ceiling: None

Temperature: 26 °C
Dew Point: 16 °C

Weather Conditions at Accident Site: Visual Conditions

Accident Information

Aircraft Damage: Destroyed
Aircraft Fire: Ground
Aircraft Explosion: None

- Injury Summary Matrix

<table>
<thead>
<tr>
<th></th>
<th>Fatal</th>
<th>Serious</th>
<th>Minor</th>
<th>None</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Pilot</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Second Pilot</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Student Pilot</td>
<td></td>
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<tr>
<td>Flight Instructor</td>
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<tr>
<td>Check Pilot</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Flight Engineer</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cabin Attendants</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other Crew</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Passengers</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>- TOTAL ABOARD -</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Other Ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- GRAND TOTAL -</td>
<td>2</td>
<td></td>
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<td></td>
<td>2</td>
</tr>
</tbody>
</table>
### Administrative Information

**Investigator-In-Charge (IIC)**

Mitchell F. Gallo

**Additional Persons Participating in This Accident/Incident Investigation:**

- David Nelson
  - Federal Aviation Administration; MSP FSDO
  - Minneapolis, MN