Aviation Investigation Final Report

Location:	Agnos, Arkansas	**Accident Number:**	CEN10FA042
Date & Time:	November 6, 2009, 10:05 Local	**Registration:**	N538CJ
Aircraft:	ZENITH AIRCRAFT CO ZODIAC 601 XL	**Aircraft Damage:**	Destroyed
Defining Event:	Part(s) separation from AC	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The light-sport airplane experienced an in-flight break-up during a cross-country flight. Flight track data recovered from an onboard global positioning system, and a subsequent performance study, depicted the airplane was maneuvering between the altitudes of 2,500 and 3,500 feet at airspeeds between about 60 and 108 knots calibrated airspeed (KCAS). The airplane performed a number of turns and maneuvers during the hour-plus flight, including a landing approach and pass over an airport. The calculated bank angle for the entire flight never exceeded 30 degrees. At the time when the breakup occurred, the airplane was climbing at about 500 feet per minute through 2,800 feet altitude and had accelerated to 100 KCAS. The estimated angle of attack was about 3 degrees during the last minute of the flight, and the airplane wreckage was spread over 600 feet on the ground. An examination of the airplane wreckage revealed compression buckling and upward and downward bending of both wings. The upward and downward movement, twisting, and flexing of the airplane wing surface was consistent with the occurrence of aerodynamic flutter. In addition, damage was noted on the flap assemblies consistent with over travel. Ultimately both wings failed in down bending. An examination of the engine revealed no anomalies. The accident pilot was experienced in the accident airplane and had built the airplane from a kit.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The in-flight separation of both wings due to aileron flutter. The aileron flutter was the result of inadequate wing stiffness and strength and the lack of aileron counterbalances.

Findings

Aircraft	(general) - Failure
Aircraft	(general) - Design
Aircraft	Ailerons - Design
Aircraft	Ailerons - Fatigue/wear/corrosion

Factual Information

History of Flight

Enroute-cruise	Part(s) separation from AC (Defining event)

HISTORY OF FLIGHT

On November 6, 2009, at 1005 central standard time, a Zenith Aircraft Company Zodiac 601 XL, experimental light sport airplane, N538CJ, was destroyed when it impacted terrain, following an in-flight breakup near Agnos, Arkansas. Visual meteorological conditions prevailed at the time of the accident. The personal flight was being conducted under the provisions of 14 Code of Federal Regulations Part 91 without a flight plan. The sport pilot was fatally injured. The cross country flight departed Sharp County Regional Airport (KCVK), Ash Flat, Arkansas, at 0848.

The property owner discovered the wreckage of the accident airplane in his field. There were no known or identified witnesses to the events that led up to the accident flight or impact sequence. Federal Aviation Administration (FAA) radar data was not available for the accident flight. The pilot was not in communications with other pilots or airport ground personnel in the area or air traffic control at the time of the accident.

The debris field was scattered over 600 feet on a magnetic bearing of 35 degrees initiating with the right wing assembly which came to rest in a pond. The left wing assembly came to rest forward of the right wing. The left wing spar, left wing fuel tank, various cockpit items, and personal effects were located in the debris field. The fuselage, empennage, engine, and propeller assembly came to rest, inverted, approximately 600 feet from the right wing. There were no ground scars identified between the right wing and the main wreckage that could be associated with the left or right wing, empennage, or fuselage.

The wreckage was recovered and relocated to a facility in Clinton, Arkansas, for further examination.

PERSONNEL INFORMATION

The pilot, age 71, held a sport pilot certificate issued on January 12, 2008. In addition, he held a repairman certificate for light sport aircraft – Zodiac 601 XL, N538CJ. He was issued a third class airman medical certificate/student pilot certificate on July 24, 2007. The medical certificate contained the limitations “holder must wear corrective lenses” and “not valid for any class after May 31, 2008.” The pilot held a valid driver’s license for the state of Illinois.

The pilot’s personal flight logbook was located in the vicinity of the main wreckage. The cover

and first four pages of the logbook had torn and were not found within the main wreckage or debris field. A review of the logbook indicated that the pilot had logged 116 hours of flight time, of which 77 hours were in the accident airplane make and model. The pilot had logged two hours in the previous 90 days. According to the logbook, the pilot successfully demonstrated the skills required to be proficient for a sport pilot certificate on January 12, 2008.

AIRCRAFT INFORMATION

According to FAA records, the pilot/owner manufactured the 2007 experimental light sport airplane, a Zenith Zodiac 601 XL (serial number 6-6528). It was registered with an FAA special airworthiness certificate in the category of experimental for light sport operations. Block 8A "Existing Aircraft without an airworthiness certificate & do not meet 103.1" was checked. A Jabiru 3300 engine rated at 120 horsepower at 3,300 rpm powered the airplane. The engine was equipped with a two-blade Sensenich propeller.

The airplane registered to and operated by the pilot was maintained under an annual condition inspection program. The maintenance records were not with the airplane wreckage. Several requests were sent to the owner's estate, requesting that the maintenance records and airplane information, or copies of those records and information be provided to the National Transportation Safety Board (NTSB) for their review. These records were not located by the bank handling the estate. Requests sent to family members were not responded to.

FAA records showed that Zenith Aircraft Company manufactured the accident airplane. However, the bill of sale for the airplane showed that it was a kit that had been sold from Zenith Aircraft Company, Mexico, Missouri, and the aircraft manufacturer was listed as "Charles Cummings," with the Zodiac 601 XL designated as a kit.

Following the accident, a representative from Zenair in Canada (also a party to the accident investigation) informed the NTSB investigator-in-charge (IIC) that the accident pilot had previously experienced and reported an encounter with flutter in the accident airplane. The NTSB made contact with the owner of Flight Crafters who was identified as the source of this report. This individual clarified that the pilot had not reported this encounter to him, but rather he had heard of this encounter through other pilots in the area. Multiple attempts were made to locate the individual with whom the pilot had spoken with regarding the flutter event. This report could not be substantiated through first hand information, fact gathering, or interviews.

A review of the Experimental Aircraft Association (EAA) safety program records revealed that the owner/builder had not participated in either the EAA Flight Adviser or the EAA Technical Counselor Programs.

METEOROLOGICAL INFORMATION

The accident site was located between several official weather observation stations. The

closest official weather observation station was Batesville Regional Airport (KBVX), Batesville, Arkansas, located 35 nautical miles (nm) south of the accident site. The elevation of the weather observation station was 465 feet mean sea level (msl).

The routine aviation weather report (METAR) for KBVX, issued at 1015, reported winds 170 degrees at 10 knots, gusting to 15 knots, visibility 10 statute miles, sky condition few clouds at 3,400 feet, temperature 17 degrees Celsius (C), dew point 04 degrees C, altimeter 30.25 inches of Mercury.

The METAR report for Walnut Ridge Regional Airport (KARG), Walnut Ridge, Arkansas, issued at 0955, (located 38 nm east-southeast of the accident site) reported winds 180 degrees at 8 knots, visibility 10 statute miles, sky condition clear, altimeter 30.27 inches of Mercury. Temperature and dew point were not reported.

The METAR report for Ozark Regional Airport (KBPK), Mountain Home, Arkansas, issued at 0953 (located 38 nm west of the accident site) reported winds 180 degrees at 8 knots, visibility 9 statute miles, sky condition clear, temperature 18 degrees C, dew point 10 degrees C, altimeter 30.19 inches of Mercury.

Two regional pilot reports (PIREPS) issued at 1153 and 1444 reported no turbulence. An Airmen's Meteorological Information (AIRMET) for moderate turbulence below 8,000 feet was in effect for the accident airplane's route of flight. There were no Significant Meteorological Information (SIGMETS) active for the area at the time of the accident.

In addition to the official weather observation stations, a Department of Interior weather station, designation ESDA4, was located 12 nm south-southwest of the accident site at an elevation of 538 feet. The station reported winds at 179 degrees at 4.33 knots with wind gusts to 10.44 knots.

FLIGHT RECORDERS

A Garmin GPSMap 296 handheld global positioning system (GPS) unit was located within the wreckage of the accident airplane. The unit was recovered and sent to the NTSB Vehicle Recorders Laboratory in Washington, D.C., for download. Upon arrival at the lab, power was applied to the unit and the recorded waypoint, route, and track log data were successfully downloaded from the unit via the USB port.

Eighty-six user defined waypoints, one user defined route, and 118 track logs were downloaded from the unit. This data included date, time, altitude, distance from previous update, time since previous update, average groundspeed since previous update, average course since previous update, and the latitude and longitude at the time of the update.

The track log data from the date of the accident started at 0848:06 and ended at 1004:56. The last position of the airplane was recorded at 36 degrees 15.061 minutes north latitude and 91

degrees 41.449 minutes west longitude. The last calculated groundspeed velocity of the airplane was 117 miles per hour. The last calculated course of the airplane was 081 degrees true.

The plotted data depicted the accident airplane depart KCVK and fly southwest towards Horseshoe Bend Airport (K6M2), Horseshoe Bend, Arkansas. The data was consistent with the performance of a touch and go landing at K6M2, and then a northeasterly departure from K6M2.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in a sparsely vegetated hilly field just south of Agnos, Arkansas. The right wing initiated the debris field, coming to rest inverted in a pond at a measured elevation of 820 feet. The wing included the right aileron and right flap; both remained attached to the wing assembly.

The left lower wing spar cap was located approximately 55 feet from the right wing. This spar separated from the left wing, and was bowed, forming a semi-circular shape.

The left wing was located approximately 190 feet from the right wing at a measured elevation of 838 feet. The left wing came to rest inverted. The left wing included the left aileron and left flap; both remained attached to the wing assembly. The leading edge of the left wing separated partially from the wing assembly along the lower rivet line from the wing root outboard to the landing light.

The left fuel tank came to rest 96 feet from the left wing. The fuel tank was bent and broken due to impact damage. Adjacent to the left fuel tank was a semi-circular ground scar, consistent in shape with the fuel tank. The ground scar contained a fluid consistent in color, smell, and texture with aviation fuel.

The main wreckage was located 295 feet from the fuel tank and came to rest inverted, directly beneath power lines and adjacent to a tree. The main wreckage consisted of the fuselage, empennage, and engine and propeller assembly. The empennage consisted of the horizontal and vertical stabilizer, rudder, and elevator. The empennage remained attached to the fuselage. The vertical stabilizer was crushed to the left, nearly 90 degrees.

The fuselage included the cabin area, instrument panel, and the flight controls, including the control cables for the right and left ailerons, rudder, and elevator. The main landing gear assembly separated from the main wreckage and came to rest adjacent to the main wreckage. The engine assembly remained attached to the fuselage. The engine was embedded in the ground approximately one foot.

The elevator control cables were continuous from the forward fuselage, through the autopilot servo to the elevator. The rudder cables were continuous from the forward fuselage aft to the

rudder. The aileron cables were continuous from the cabin area outboard to the left and right bell cranks. Both aileron bell crank assemblies separated from the left and right wings.

MEDICAL AND PATHOLOGICAL INFORMATION

The Arkansas State Crime Laboratory performed the pilot's autopsy on November 9, 2009. The autopsy concluded that the cause of death was due to "blunt force injuries."

The FAA's Civil Aerospace Medical Institute, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference Number 200900281001). Results were negative for carbon monoxide, cyanide, and ethanol. Atenolol and valsartan were detected in the urine and blood, and ibuprofen was detected in the urine.

TESTS AND RESEARCH

Aileron/Wing Design

The ailerons were protected from flutter through the use of high aileron control cable tension. The high cable tension altered the dynamic interaction between the wing and aileron, similar to increasing the stiffness of the wing. High cable tensions provided a level of protection from aileron flutter. After several accidents in Europe, the United Kingdom Light Aircraft Association designed and flight tested ailerons fitted with counter balances. Counter balances are considered a more direct mitigation strategy to prevent aileron flutter.

Wreckage Examination

The wreckage examination was conducted by investigators from the NTSB, including two aeronautical engineers, and was attended by representatives from FAA and Zenair on November 8, 2009. An additional wreckage examination was conducted on June 15, 2010, by NTSB investigators.

Right Wing

The leading edge of the right wing, inboard of the wing locker was crushed in. The upper skin on the right wing, between spars, exhibited 45-degree skin wrinkles emanating from the inboard edge of the aileron. A circular witness mark, black in color, was documented on the lower wing skin consistent with contact with the right main landing gear tire.

The center section of the wing spar remained attached, through to the fuselage support bracket on the opposite side of the fuselage. The lower spar cap exhibited a twist consistent with the wing trailing edge moving up. The upper cap also exhibited a twist, with some forward bending, also consistent with the wing trailing edge moving up.

Multiple witness marks were noted on the upper, leading edge surface of the right flap, corresponding with the adjacent rivet line along the trailing edge of the right wing. A flap stop had been installed on the trailing edge of the wing. The three rivets utilized to secure the stop had not been painted consistent with recent or new installation.

The right aileron remained attached to the wing and exhibited one impact mark adjacent to the aileron stop. When examined, the existing damage prevented deflecting the aileron to the point required to contact the aileron stop. The right aileron bell crank was attached to the support structure (a wing rib) and to the cable. The assembly and small portion of the wing rib were separated from the wing structure and also from the aileron. Tension in the cable assembly prior to the breakup could not be quantified.

Left Wing

The leading edge skin on the left wing was detached from the lower surface of the wing. The skin remained attached to the upper surface of the wing along the main spar. A long, narrow black mark was noted on the bottom of the wing skin consistent, in texture and color, with contact with the left main landing gear tire. The upper wing skin, between the first four spars lines, exhibited diagonal wrinkles.

The lower spar cap for the left wing separated from the wing assembly. The upper spar cap was bent down. The left wing fuel tank separated from the wing assembly.

Multiple witness marks were noted on the upper, leading edge surface of the left flap, corresponding with the adjacent rivet line along the trailing edge of the left wing. A flap stop had been installed on the trailing edge of the wing. This flap stop was thicker than the flap stop installed on the right wing. The three rivets utilized to secure the stop had not been painted consistent with recent or new installation. The outboard edge of the left flap was bent.

The left aileron remained attached to the wing. The outboard hinge was broken. The left aileron bell crank was attached the support structure (a wing rib) and to the cables. The assembly and small portion of the wing rib were separated from the wing structure and also from the aileron. The aileron trim tab exhibited a stream wise tear on the upper surface. Tension in the cable assembly prior to the breakup could not be quantified.

Flap Control Assembly

The right and left flap extension was driven by a small motor, mounted directly aft of the pilots seat. Examination revealed a loose condition in the flap control arm. Further examination revealed that the loose condition existed between the motor control arm and the left flap control arm. Two bolts, measuring 1 and ¾ inches in length, were utilized to attach the left control arm to the through bar, and motor control arm. The bolts were secured through corresponding holes with the motor and right and left control arm assemblies, utilizing a lock nut and one single washer between the nut and arm. Disassembly of flap control assembly

revealed multiple witness marks between the control arm surface and the bolt. The lock nut was as far down on the bolt as the threads would allow, and was resting on the shank of the bolt.

Structures Study

For this study, NTSB investigators conducted extensive examination of the airplane wreckage from this accident and other similar accidents. In addition, NTSB investigators referred to the results of flight and static testing, accident investigation reports, and special studies conducted by several investigative and certification authorities from the United States, United Kingdom, Netherlands, and Germany.

Both rear spar caps exhibited compression damage to the upper and lower flanges of the rear spars at the area where the flap and aileron met. The compression buckling, on both the top and bottom surfaces, was consistent with the outboard section of the trailing edge bending both upward and downward. The bending trailing edge spar introduced large torsion loads into the entire wing structure. This bending also resulted in large displacements of the outboard, aft wing sections. In effect, the outboard section of the wing became a very large aileron-type surface that directly introduced large lift load excursions into the wing section. Stresses became very high at the spar, especially further inboard. The rear spar of the left wing exhibited compression buckling of both upper and lower flanges at mid-span of the flap. The bottom buckling was inboard of the top buckling. The lower flange of the right wing, rear spar also exhibited similar compression damage.

Both flaps exhibited longitudinal scratches that aligned with the rivet heads on the underside of the upper, rear spar flange. The scratches are consistent with the over-travel of the flaps in an upward direction. However, it is unknown if the scratches occurred before or after the breakup or before or after the addition of the flap stops. It was noted that one of the slots that holds the flap actuator pin was elongated prior to the accident.

There was a general disruption of the skins of both wings, top and bottom, which was not consistent with a single static overload event. The aileron and aileron tab show a general disruption of both structures that was not consistent with a single static overload event.

The structural damage outboard of both wing roots and to their respective flaps was consistent with aerodynamic loading in both the up and down direction that results from flutter. In addition, the type of damage noted above would normally have to occur prior to separation of the three major attachment points (except for the scrapes on the top of both flaps). The attachments at the root of the wing provided the structural resistance to the aerodynamic loads that produced the damage to the rear spar. Once the capability to resist the aerodynamic loads was eliminated, the bending loads in the structure dropped dramatically.

The type of damage noted above is not typically consistent with an aerodynamic static overload. While each type of damage noted above may be individually found in cases of

aerodynamic static overload, the total numbers of examples and opposite directions of failure are more consistent with aerodynamic flutter.

Details of the NTSB Structures Study can be found in the public docket for this accident.

Performance Study

For this study NTSB investigators utilized GPS data, meteorological data, and estimated aircraft configuration data with a simplified aerodynamic model to estimate the accident airplane's airspeed, attitudes, load factors, and engine power required as a function of time.

During the investigation it was established that Zenith Aircraft Company does not develop or provide a pilot operating handbook (POH) or airplane flight manual (AFM) for their kits. They are not required to. The airframe manufacturer, in this case the amateur builder and pilot, was responsible for developing the POH. The POH for the accident airplane could not be located and therefore the airplane-specific limitations were not documented. The performance study was based upon the best available technical data and engineering judgment.

The results indicate that the accident airplane departed KCVK from runway 22 and generally flew between 2,500 and 3,500 feet at airspeeds between 60 and 108 knots calibrated airspeed (KCAS). The airplane performed a number of turns and maneuvers during the hour-plus flight, including a landing approach or airport pass. The calculated bank angle during the flight never exceeded 30 degrees. At the time of the in-flight breakup, the airplane was climbing about 500 feet per minute (fpm) through 2,800 feet and had accelerated to 100 KCAS. The estimated angle of attack was about 3 degrees during the last minute of the flight. The flight parameters derived from GPS data provide no indication of any maneuvers leading to the in-flight breakup.

Details of the NTSB Performance Study can be found in the public docket for this accident.

ADDITIONAL INFORMATION

Previous Accidents

The NTSB has conducted accident investigations involving four other Zodiac 601 XL airplanes where structural failure was noted as a concern. On February 8, 2006, a CH 601 XL (NTSB case number LAX06LA105), crashed into terrain near Oakdale, California, after its wings collapsed as the airplane entered the traffic pattern of the nearby airport. On November 4, 2006, a CH 601 XL (NTSB case number LAX07FA026), broke up during cruise flight near Yuba City, California. On April 7, 2008, a CH 601 XL (NTSB case number NYC08FA158), broke up in flight near Polk City, Florida. On March 3, 2009, a CH 601 XL (NTSB case number WPR09FA141, broke up during cruise flight near Antelope Island, Utah. The details of each of these investigations are available at http://www.ntsb.gov/ntsb/query.asp.

NTSB Recommendation

On April 14, 2009, the NTSB issued eight recommendations to the FAA; one of which was classified as urgent. These recommendations were in response to multiple accidents involving in-flight structural break-ups in the Zodiac 601XL aircraft in the United States and abroad. The eight recommendations encompassed all categories of issued airworthiness certificates (experimental, homebuilt, special light sport, and experimental light sport). These recommendations urged the FAA to look into and take action regarding potential structural issues.

Zodiac 601 XL

There are several businesses associated with the Zodiac 601 XL airplane. These companies all have different functions and associations with the Zodiac 601 XL airplane. Chris Heintz, designer of the airplane, is the holder of the intellectual property associated with the design. Zenair in Canada sells S-LSA parts and assemblies of the Zodiac 601 XL. Zenith Aircraft, based in Mexico, Missouri, sells kits and parts for experimental airplanes. These kits include the STOL CH 701, STOL CH 750, Zodiac CH 650, and Zodiac CH 601 XL. Aircraft Manufacturing and Development Company finishes assemblies of S-LSA for sale. This particular company is no longer in business. Lastly, Aircraft Manufacturing and Design, LLC, which conducts the same business as the former, operates out of Eastman, Georgia. It is reported that these businesses are 100 percent independent one from the other.

Safety Alert/Safety Directive

On November 7, 2009, in reaction to the subject accident and FAA review of the airframe design, Aircraft Manufacturing and Design, LLC, under the advisement of Zenair, released a Safety Alert/Safety Directive to all Aircraft Manufacturing & Development and Aircraft Manufacturing & Design, LLC Zodiac 601 XL and CH 605 airplanes. It was also suggested that owners and operators of the CH 601 XL and CH 650 experimental amateur built airplanes also comply with this alert/directive. This document provided corrective actions intended to strengthen and stiffen the wing in order to decrease the likelihood structural overload and aerodynamic flutter. In addition, the document provided for the installation of aileron counter balances that also decrease the likelihood of aerodynamic flutter of the ailerons. This alert/directive required all owners of the SLSA 601XL to comply with the mandatory upgrade to the wing structure and aileron counterbalance weights before the next flight. The airplanes certificated as experimental, amateur built, are not required to comply with the Safety Directive.

In addition to the upgrade kit, this Safety Alert/Directive also advised owners and operators to check flight control cable tension, check for aileron free play, and to check flap free play prior to every flight. The owner/operators were also asked to ensure that their air speed indicators indicated the correct speeds, ensure that the canopies latched correctly, and that luggage was also secured before flight.

FAA Special Airworthiness Information Bulletin

On November 7, 2009, in reaction to the subject accident and in response to recommendations issued by the NTSB, the FAA issued Special Airworthiness Information Bulletin (SAIB) CE-10-08: Wings: Zodiac CH 601 XL and CH 650 Wing Structural Modifications. This SAIB recommended that all owners of the SLSA Zodiac CH 601 XL and CH 650 airplanes comply with the safety alert /directive issued by Aircraft Manufacturing & Design, LLC. In addition, the SAIB recommended that amateur built and experimental aircraft, which share design characteristics with the CH 601 XL and the CH 650, also comply with this safety alert/directive.

Amateur Built versus Experimental Light Sport Aircraft

According to FAA Advisory Circular 20-27G, an Amateur Built airplane is defined as “an aircraft in which the major portion has been fabricated and assembled by a person(s) who undertook the construction project solely for their own education or recreation. Amateur-built aircraft may be constructed from an amateur builder’s original design, from purchased plans, or from a kit.”

The FAA Amateur-Built Kit List listed the Zenith Aircraft Company Zodiac CH 601 (parts), Zodiac CH 601 HD (parts list), Zodiac 601 HDS (parts list), and Zodiac CH 601 XL (drawings, manuals, and parts list) as having been evaluated by the FAA. According to the FAA, this evaluation illustrated that the kit would meet the “major portion” requirement of 14 CFR Part 21.191 (g). This evaluation is not a certification or approval.

According to FAA, an Experimental Light Sport Aircraft (E-LSA) can take three different directions:

1. The airplane was registered from a previously unregistered airplane prior to January 31, 2009.
2. A special light sport airplane (S-LSA) which has been modified from its original design without approval from the manufacturer
3. The airplane has been built from an ASTM standards E-LSA kit.

According to Zenith Aircraft Company, they have never produced an E-LSA “kit” for the Zodiac 601 XL nor do they provide a manufacture’s statement of compliance for the direction and intent of the E-LSA kit. The paperwork they provide the owner/buyer of their kit states that the kit being purchased is an experimental amateur built airplane.

Pilot Information

Certificate:	Sport Pilot	**Age:**	71,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Sport pilot	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 12, 2008
Flight Time:	116 hours (Total, all aircraft), 77 hours (Total, this make and model), 2 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ZENITH AIRCRAFT CO	**Registration:**	N538CJ
Model/Series:	ZODIAC 601 XL	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental light sport (Special)	**Serial Number:**	6-6528
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	JABIRU
ELT:	Installed, not activated	**Engine Model/Series:**	3300
Registered Owner:	CUMMINGS CHARLES	**Rated Power:**	
Operator:	CUMMINGS CHARLES	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KBPK,928 ft msl	**Distance from Accident Site:**	38 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear / 3400 ft AGL	**Visibility**	9 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.19 inches Hg	**Temperature/Dew Point:**	18°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Ash Flat, AR (KCVK)	**Type of Flight Plan Filed:**	None
Destination:	Ash Flat, AR (KCVK)	**Type of Clearance:**	None
Departure Time:	08:48 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	36.255279,-91.693054

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Robert Drake; FAA; Washington, DC Mathieu Heintz; Zenith Aircraft Company; Mexico, MO
Original Publish Date:	April 28, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=75021