Aviation Investigation Final Report

Location:	Siasconset, Massachusetts	**Accident Number:**	ATL07LA115
Date & Time:	August 17, 2007, 20:21 Local	**Registration:**	N869CD
Aircraft:	Cirrus Design Corp. SR20	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The non-instrument rated pilot was conducting a night VFR flight to his destination airport. As the pilot neared the airport, he initiated a descent and established radio contact with the control tower. The controller pointed out traffic and instructed the pilot to continue for runway 24. The pilot continued his descent and was informed by the controller that the airport was changing to IFR and instructed the pilot to contact approach control. A low layer of clouds had moved into the area. The pilot contacted the approach controller and asked if he could perform the ILS runway 24 approach. The controller started vectoring the pilot for a left downwind, and asked the pilot if he was instrument qualified and current. The pilot replied, "We are IFR qualified," even though he was not. The controller informed the pilot to turn left to a heading and the pilot responded by saying he was turning right The controller again instructed the pilot to turn to the left, expect the ILS runway 24 approach, and to advise that he had the current airport information. The pilot responded by saying he was turning right and that he would pick up the airport information. The controller informed the pilot that it was not a right turn, and informed the pilot he had turned in the wrong direction on the last turn and to turn to the left. The pilot replied that he was turning to the left to the assigned heading. The controller asked the pilot what his type of airplane was, and the pilot replied, "Cirrus I had to pull the parachute." The pilot stated in an interview with the NTSB that he was struggling to keep the airplane level; he was in instrument conditions, in a black hole without a visible horizon or ambient light, and that he became spatially disoriented and pulled the parachute. Advisory Circular 60-4A states in part, "The attitude of an aircraft is generally determined by reference to the natural horizon or other visual references with the surface. If neither horizon nor surface references exist, the attitude of an aircraft must be determined by artificial means from the flight instruments. Sight, supported by other senses, allows the pilot to maintain orientation. However; during periods of low visibility, the supporting senses sometimes conflict with what is seen. When this happens, a pilot is particularly vulnerable to disorientation." Because of the clouds that had moved into the area, the pilot likely could not distinguish ground cues that would have helped him determine the airplanes attitude. Without an instrument rating, the pilot was unable to use

his flight instruments to help him successfully orient and land the airplane. Had the pilot informed the controller that he was not instrument rated, the controller may have been able to instruct the pilot to climb to visual flight conditions and land at another VFR airport.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The non-instrument rated pilot's loss of control at night in instrument flight conditions due to spatial disorientation. A factor was the pilot's in-flight decision not to inform the controller that he was not instrument rated.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: MANEUVERING

Findings
1. LIGHT CONDITION - DARK NIGHT
2. WEATHER CONDITION - CLOUDS

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

Findings
3. (C) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
4. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT

Findings
5. OBJECT - GUY WIRE
6. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On August 17, 2007, at 2021 eastern daylight time, a Cirrus SR20, N869CD registered to a private owner, operating as a 14 CFR Part 91 personal flight deployed the Cirrus Airframe Parachute System (CAPS) after encountering instrument flight conditions (IFR) while descending to land at Nantucket Memorial Airport, Nantucket, Massachusetts. Instrument meteorological conditions prevailed at the time of the accident. No flight plan was filed however a full weather briefing was obtained before departing on the visual flight rules flight. The airplane received substantial damage. The non-instrument rated private pilot received serious injuries and one passenger received minor injuries. The flight originated from Westchester County Airport, White Plains, New York, on August 17, 2007, at 1901.

The Nantucket Tower controller stated the pilot established initial radio contact at 2010. The controller informed the pilot to continue for runway 24 and pointed out traffic. The pilot reported at 2012 that he had the traffic in sight. At 2013, the controller received a PIREP of a " low layer forming above the approach to runway 24." The controller advised the pilot at 2014 that the airport was going IFR, and switched the pilot to Cape Approach. The pilot informed the controller that he was capable of executing the instrument landing system (ILS) approach.

Review of transcripts between the pilot and Cape Approach revealed the pilot made initial radio contact at 2015, and requested the ILS runway 24 approach at Nantucket. Cape Approach asked the pilot for his current heading and the pilot replied 150. The controller informed the pilot to continue on the heading and expect a left downwind for the ILS approach. The pilot asked the controller if he wanted him to climb, and the controller suggested 2,000 feet, and the pilot acknowledged the altitude.

The controller stated at 2016: 43, "November nine charlie delta confirm that you are IFR equipped and qualified." The pilot replied, " Nine Charlie delta we are uh IFR qualified." At 2016: 50, the controller instructed the pilot to climb and maintain 2,000 feet and to turn left heading 090. The pilot replied, "Nine Charlie delta two thousand turning right two nine zero." The controller replied at 2017:03, "November nine Charlie delta roger you're cleared to Nantucket via heading uh zero seven zero climb and maintain two thousand." The pilot replied, "Nine Charlie delta right uh zero seven zero at two thousand." The controller replied at 2017:54, "November nine Charlie delta turn left heading zero six zero expect the ILS approach runway two four advise with new ATIS kilo." The pilot replied, "Nine charlie delta turning right to zero six zero we will pick up kilo." The controller stated at 2018:06, "Nine charlie delta that's not a right turn sir should be a left turn left turn heading uh zero six zero looks like you went right on the last turn so just turn left a gradual left turn to zero six zero." The pilot replied, nine charlie delta a gradual left turn to zero six zero. At 2019:37 the controller asked the pilot to say his

type of aircraft. The pilot replied at 2019:39, "Cirrus I had to pull the parachute." The controller replied, November nine charlie delta are you able to make it to the airport sir. The pilot stated, "No the parachute on the plane its going to come down." The controller replied at 2020:02, "November nine charlie delta roger low altitude alert check your altitude immediately and uh advise if you need any further assistance it appears that you are over land at this time." There were no other radio transmissions between the pilot and the controller.

The pilot told the NTSB investigator during an interview that he informed the controller that he was instrument-qualified because he was getting concerned. His wife was six months pregnant and he feared they would end up in the water. The pilot stated he was struggling to keep the airplane level; he was in instrument conditions in a black hole with out a visible horizon or ambient light. The pilot further stated, "I became spatially disoriented and pulled the chute." When the pilot was asked if there was anything mechanically wrong with the airplane or the flight instruments, the pilot stated no.

PERSONNEL INFORMATION

Review of information on file with the FAA Airman's Certification Division, Oklahoma City, Oklahoma, revealed the pilot was issued a private pilot certificate on April 12, 2004, with ratings for airplane single engine land. The pilot did not have an instrument rating. The pilot's last biennial flight review was conducted on March 25, 2007, in the SR20. The pilot held a third-class medical issued on April 24, 2007, with the restriction "must wear corrective lenses." The pilot indicated on his application for the third-class medical certificate he has 500 total flight hours.

Review of the pilot's logbook revealed that the pilot has 454.6 total flight hours of which 285.3 hours are in the SR20, and 245.5 hours are as pilot-in-command (PIC). The pilot's first flight in the SR20 was on April 16, 2004. The pilot had 34 hours of dual actual instrument flight time, and the last recorded dual instrument flight was on August 10, 2007. The pilot had 66.2 hours of simulated instrument time, and the last simulated instrument flight was conducted on July 25, 2007. The pilot had 40.6 hours of night flight time, and the last recorded dual night flight was on July 25, 2007. The pilot had flown 26.9 hours in the last 90 days, of which 0.2 hours were night dual flight, 1.5 hours of dual instrument flight, and 6.1 hours of dual simulated instrument flight. The pilot had flown 11.9 hours in the last 30 days, of which 0.2 hours were night dual flight, 1.5 hours of actual dual instruments, and 1.5 hours of dual simulated instruments. The pilot attended the Cirrus factory-training course from April 17, 2004 through April 18, 2004. The pilot received 7 hours of ground instruction, and 13.4 hours of dual flight instruction.

AIRCRAFT INFORMATION

Review of the airplane logbooks revealed the last recorded annual inspection was conducted on January 12, 2007, and the Hobbs time was 330.3 hours. The Hobbs meter at the crash site read 370.5 hours and the airplane has flown 140.2 hours since the last annual inspection. The

altimeter, encoder, and static system test were conducted on February 1, 2006. The pilot purchased 35 gallons of 100-low lead fuel at West Air, White Plains, New York, on August 11, 2007, seven days before the accident.

METEOROLOGICAL INFORMATION

The Nantucket Memorial Airport 1953 surface weather observation was: wind 220-degrees at 7 knots, visibility 6 statute miles, clear, temperature 68-degrees Fahrenheit, dew point temperature 62-degrees Fahrenheit, and altimeter 29.82.

A Special weather observation was issued at 2018. The wind was 220-degrees at 8 knots, visibility 1 statute mile in light rain and mist, vertical visibility 100 feet, temperature 68-degrees Fahrenheit, dew point temperature 66-degrees Fahrenheit, and altimeter 29.82. Remarks: automated observation, rain began 2017, hourly precipitation less than 0.01 inches. Three special weather observations were issued at 2025, 2045, and 2050.

Review of the US Naval Observatory Sun and Moon Data for Nantucket County Memorial Airport at the time of the accident revealed a, " waxing crescent with 20-percent of the moon's visible disk illuminated.

The pilot of N869D obtained a full weather briefing at 1135, for the VFR flight from Westchester to Nantucket. The pilot obtained a follow up weather briefing before departing Westchester County Airport at 1816. The briefer informed the pilot that the first batch of storms went through New York, and dissipated with some rain, " but if you take off at this point uh nothing but a little light rain on the route." The pilot did not receive updated weather while en-route to Nantucket.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in the vicinity of a United States Coast Guard loran signal tower adjacent to a residence in Siassconset Massachusetts, and 5 miles southeast of the Nantucket Memorial Airport. The airplane collided with a guy wire supporting the 650-foot tall loran signal tower on a heading of 040-degrees magnetic. Two pieces of parachute material were observed entangled on one of the loran guy wires. The airplane came to rest on a heading of 323-degrees magnetic.

The upper and lower engine cowling was partially separated from the airframe. The engine assembly was partially separated from the firewall and displaced to the left about 20-degrees. Both upper engine mount welds separated between the firewall bolt attachment points and the first welded joint along the steel tubing. The lower two engine mounts remained attached to the firewall. The lower left section of the firewall was displaced aft, and the lower right side of the firewall was displaced in the forward direction and to the left. All engine accessories remained attached to the engine except for the starter, No. 2 alternator and right magneto. The fuel supply line to the fuel distribution manifold was disconnected and fuel was present in the

fuel line. The nose wheel assembly separated from the nose landing gear strut at the fishmouth. The nose wheel was located in a 5-inch hole 7-feet in front of the wreckage.

The engine was equipped with an engine monitoring system. The primary flight display (PFD) and the internal compact flash memory module from the multi-function display (MFD) were removed and sent to the NTSB Vehicle Recorders Laboratory for further examination. Examination revealed the PFD and the MFD memory card were not damaged. A binary copy of the memory card was made in the NTSB laboratory, and the copy was read out using a bench MFD. The PFD was connected to a bench MFD and downloaded. The raw PFD download file was sent to the manufacturer for decoding into ASCII text. The decoded file was sorted in the NTSB laboratory, organizing it by each data type and the PFD power cycle to group similar records together, and depicts the airplane's flight data and ground track according to the global positioning unit (GPS) positions stored in the PFD logs for the accident flight. In addition, the MFD flash memory card was downloaded and depicts various engine parameters. The PFD has a logging function which reflects the instrument recordings for the accident flight, which can also be used by the manufacturer for maintenance and diagnostics.

The propeller assembly remained attached to the propeller crankshaft flange, and the propeller spinner was damaged on the lower side in the vicinity of the propeller blade root area. One propeller blade exhibited leading edge polishing and chord wise scratching was present on the cambered side of the propeller blade. Additional polishing was observed 16-inches inboard of the propeller tip-extending chord wise from the leading edge of the propeller blade aft about 1-inch. The non-cambered side of the propeller blade was not damaged. The remaining propeller blade had chord wise scratching present across the white tip striping of the propeller blade, and the scratches were brown in color. The non-cambered side of the propeller blade was not damaged.

The cabin area was intact from the firewall extending aft to two-feet aft of the CAPS enclosure. All cabin and door windows remained intact. The right cabin door remained attached to the airframe. The left cabin door was separated from the airframe by first responders. The baggage compartment door was locked. The cabin roof was not damaged. The CAPS activation handle was out of its holder and hung down by its cable about 2 to 3-inches. The activation handle holder was bent downwards. The "Remove Before Flight" safety pin for the activation handle was found stowed in the left front cabin footwell sidewall netting. The forward belly section of the fuselage was crushed and distorted. Aft floor damage was noted in the area of the aft wing attachment points. A Garmin 396 GPS was located in the cabin area and forwarded to the NTSB Vehicle Recorders Laboratory for further examination. Examination of the GPS revealed it was not damaged. The unit was powered up and no track log was recorded on the date of the accident.

Movement of the control yokes confirmed continuity of the linkages connecting the control yokes to the console aileron activation pulley. The aileron control cable system continuity was confirmed from the console aileron actuation pulley through the forward pulley gang, the rudder-aileron interconnect, the kick out pulleys, the left and right aileron actuation pulleys and

the cross over pulleys.

The CAPS strap covers were debonded from the fuselage after the CAPS system was deployed. The left and right front harnesses and rear attachment harnesses were intact and not damaged. The parachute risers were intact and not damaged. The slider was present and showed no slider stop signatures, and some suspension lines were separated. Examination of the parachute canopy revealed some damage and tearing from the apex downwards towards the skirt of the parachute. The parachute deployment bag was located near the base of the loran signal tower and was not damaged. The lanyards and incremental bridal sheath exhibited a brownish discoloration. All but 5 bartack stitches were unzipped. The 6th bartack stitch was beginning to unzip. The rocket motor case was located near the deployment bag separate of the pick-up collar. Longitudinal abrasions were present on the rocket collar. The nozzle had separated from the aft motor bulkhead and was loose in the rocket motor case. The aft motor bulkhead was removed. Visual examination of the rocket motor case revealed the propellant grains were fully expended. The rocket motor, pick-up collar, and deployment back were secured by the FAA for further examination by Cirrus. Examination of these components revealed no anomalies.

The wing was attached to the fuselage at the spar tunnel and was not damaged. The upper and lower right wing skins were damaged. The right flap was damaged, not extended, and remained attached to all three-hinge points. The right aileron remained attached at the outboard and inboard hinge points. The right main fuel tank had about 5 gallons of fuel present. The right fuel cap was intact with a tight seal, and the fuel tank was ruptured. First responders reported that fuel was leaking from the airplane at the crash site. The right main landing gear remained attached to the wing.

The empennage was separated two-feet aft of the CAPS enclosure and was located perpendicular to the fuselage connected by control cables and electrical wires. The horizontal stabilizer upper skin was buckled chordwise at about the right elevator midspan hinge point. The right and left elevator remained attached to the horizontal stabilizer at their respective hinge points. The left elevator was buckled chord wise at mid-span, and the elevator tip was damaged. The right elevator was not damaged. Movement of the control yoke confirmed continuity of the linkage to the bell crank weld on the elevator torque tube. Elevator control continuity was confirmed from the bell crank through the forward pulley gang, and the rudder elevator pulley gang to the elevator empennage bell crank. Continuity of the elevator push-pull rod was confirmed from the elevator empennage bell crank to the elevator assembly.

The vertical stabilizer was intact. The rudder separated from the vertical stabilizer at mid-span and top hinge points. Rudder control cable continuity was confirmed from the rudder pedal torque tubes through the forward pulley gang, the rudder interconnect, and the rudder-elevator pulley gang to the rudder empennage bell crank. Continuity of the rudder push-pull rod was confirmed from the rudder empennage bell crank to the rudder assembly.

The wing was attached to the fuselage at the spar tunnel and was buckled aft along the length

of the cuffed section of the wing. The upper left wing skins was buckled inboard of the wing cuff extending 45-degrees aft and outboard towards the left aileron. The upper and lower wing skins were partially disbonded from the torque box in the cuffed area of the wing. The left flap was damaged, not extended, and was separated from the outboard hinge. The left aileron remained attached at the outboard and inboard hinge points. The left aileron was removed and the roll trim motor was found in the full right trim position. The flap motor was examined and the actuation arm was extended about 4-inches from its housing which equates to the fully retracted position. The left main fuel tank was ruptured and contained about 10 gallons of fuel. The left main fuel cap was intact with a tight seal. The left main landing gear remained attached to the wing.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot was transported to Nantucket Cottage Hospital, Nantucket Massachusetts with serious injuries. A subpoena was issued for initial blood samples taken at Nantucket Cottage Hospital. The samples were forwarded to the Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma, for analysis. The results were negative for carbon monoxide, ethanol, basic, acidic and neutral drugs. No testing was performed for cyanide.

TEST AND RESEARCH

Advisory Circular 60-4A states in part, "The attitude of an aircraft is generally determined by reference to the natural horizon or other visual references with the surface. If neither horizon nor surface references exist, the attitude of an aircraft must be determined by artificial means from the flight instruments. Sight, supported by other senses, allows the pilot to maintain orientation. However; during periods of low visibility, the supporting senses sometimes conflict with what is seen. When this happens, a pilot is particularly vulnerable to disorientation. The degree of orientation may vary considerably with individual pilots. Spatial disorientation to a pilot means simply the inability to tell which way is "up."...Surface references and the natural horizon may at times become obscured, although visibility may be above flight rule minimums. Lack of natural horizon or such reference is common on over water flights, at night, and especially at night in extremely sparsely populated areas, or in low visibility conditions.... The disoriented pilot may place the aircraft in a dangerous attitude.... Therefore, the use of flight instruments is essential to maintain proper attitude when encountering any of the elements which may result in spatial disorientation."

ADDITIONAL INFORMATION

The wreckage was released to Nantucket Police Department, on August 19, 2007. The FAA retained the airplane logbooks. The pilot's log book was released to a friend of the family on August 27, 2007. The CAPS rocket motor case, pick up collar, and the FAA forwarded deployment bag to Cirrus for further examination. All components of the CAPS system retained for further examination was returned to Charles Taylor Aviation on September 27,

2007. The Garmin GPS was returned to the registered owner on October 4, 2007. The compact flash card and the primary flight display were returned to Charles Taylor Aviation on November 5, 2007.

Pilot Information

Certificate:	Private; Sport Pilot	**Age:**	41,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:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 1, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 1, 2007
Flight Time:	455 hours (Total, all aircraft), 285 hours (Total, this make and model), 261 hours (Pilot In Command, all aircraft), 27 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cirrus Design Corp.	**Registration:**	N869CD
Model/Series:	SR20	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1421
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 1, 2007 Annual	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:	140 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	371 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-360
Registered Owner:	Thomas Jackson	**Rated Power:**	200 Horsepower
Operator:	Thomas Jackson	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	KACK,48 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	20:18 Local	**Direction from Accident Site:**	130°
Lowest Cloud Condition:	100 ft AGL	**Visibility**	1 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	20°C / 19°C
Precipitation and Obscuration:	Light - None - Fog		
Departure Point:	White Plains, NY (KHPN)	**Type of Flight Plan Filed:**	None
Destination:	Nantucket, MA (KACK)	**Type of Clearance:**	None
Departure Time:	19:01 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	42.230533,-71.52951(est)

Administrative Information

Investigator In Charge (IIC):	Smith, Carrol
Additional Participating Persons:	Donald Small; Boston FSDO; Boston, MA Bradley T Miller; Cirrus Design Corporation; Deluth, MI
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Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66465