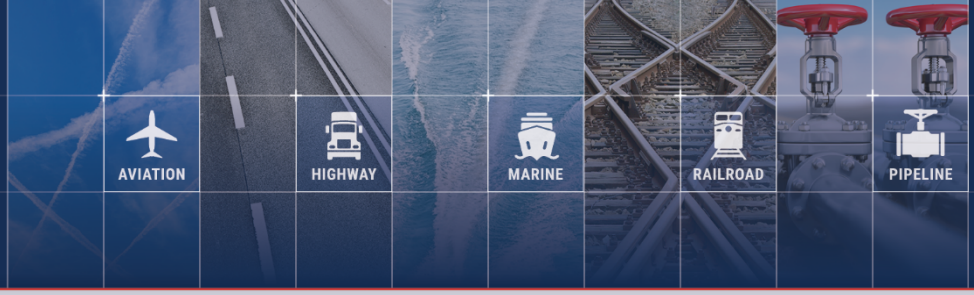

Aviation Investigation Final Report

Location:	Santee, California	**Accident Number:**	WPR22FA004
Date & Time:	October 11, 2021, 12:14 Local	**Registration:**	N7022G
Aircraft:	Cessna 340A	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal, 2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was on a cross-country flight, receiving vectors for an instrument approach while in instrument meteorological conditions (IMC). The approach controller instructed the pilot to descend to 2,800 ft mean sea level (msl) until established on the localizer, and subsequently cleared the flight for the instrument landing system (ILS) approach to runway 28R, then circle to land on runway 23. About 1 minute later, the controller told the pilot that it looked like the airplane was drifting right of course and asked him if he was correcting back on course. The pilot responded “correcting, 22G.” About 9 seconds later, the pilot transmitted “SoCal, is 22G, VFR runway 23” to which the controller told the pilot that the airplane was not tracking on the localizer and subsequently canceled the approach clearance and instructed the pilot to climb and maintain 3,000 ft. As the pilot acknowledged the altitude assignment, the controller issued a low altitude alert, and provided the minimum vectoring altitude in the area. The pilot acknowledged the controller’s instructions shortly after. At this time, recorded advanced dependent surveillance-broadcast (ADS-B) data showed the airplane on a northwesterly heading at an altitude of 2,400 ft msl.

Over the course of the following 2 minutes, the controller issued multiple instructions for the pilot to climb to 4,000 ft, which the pilot acknowledged; however, ADS-B data showed that the airplane remained between 2,500 ft and 3,500 ft. The controller queried the pilot about his altitude and the pilot responded, “2,500 ft, 22G.” The controller subsequently issued a low altitude alert and advised the pilot to expedite the climb to 5,000 ft. No further communication was received from the pilot despite multiple queries from the controller. ADS-B data showed that the airplane had begun to climb and reached a maximum altitude of 3,500 ft before it began a descending right turn. The airplane remained in the right descending turn at a descent rate of about 5,000 ft per minute until the last recorded target at 900 ft msl, located about 1,333 ft northwest of the accident site.

Recorded weather conditions at the pilot's intended destination airport about 21 minutes before the accident showed that the cloud ceilings were broken at 2,127 ft msl, overcast at 3,227 ft msl. The closest weather reporting station to the accident site, which was about 1.8 miles south, showed a broken cloud layer at 3,086 ft msl.

The airplane had undergone a conversion to modern avionics about 11 months before the accident. No reference to any additional training to the installed avionics was found within the provided pilot records. While the pilot had previous experience with other brands modern avionics, the investigation was unable to determine if the pilot had previous experience or training for the specific model of modern avionics installed in the airplane.

The controller had cleared the flight to fly the ILS approach to runway 28R, circle to land on runway 23, and ADS-B track data showed that the airplane was about to be established on the localizer when it started to veer off course to the right, ultimately into an area with minimum vectoring altitudes that required the controller to issue instructions to the pilot to climb. During the divergence from the instrument approach, the airplane was at an altitude above the reported base of the broken cloud layer and below the base of the overcast layer at the destination airport, which most likely placed the airplane in and out of IMC conditions. Ultimately, the airplane climbed back into IMC conditions. It could not be determined if the pilot had inadvertently misconfigured the avionics for the instrument approach. Continuing the instrument approach would have afforded the pilot the opportunity to fly a stabilized approach in protected airspace and safely descend below the cloud layer prior to conducting the circle to land on runway 23.

Given the airplane was maneuvering in IMC, it placed the pilot in conditions conducive to the development of spatial disorientation. The accident circumstances, including the tightening descending turn, and the subsequent high-energy impact, are consistent with the known effects of spatial disorientation. Additionally, examination of the airframe and engines revealed no evidence of any preexisting anomalies that would have precluded normal operation. Therefore, it is likely that the pilot was experiencing the effects of spatial disorientation when the accident occurred.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Loss of control due to spatial disorientation.

Findings

Personnel issues	Spatial disorientation - Pilot
Personnel issues	Decision making/judgment - Pilot
Environmental issues	Low visibility - Decision related to condition

Factual Information

History of Flight

Approach-IFR initial approach	Other weather encounter
Approach-IFR initial approach	Loss of control in flight (Defining event)
Approach-IFR initial approach	Collision with terr/obj (non-CFIT)

On October 11, 2021, about 1214 Pacific daylight time, a Cessna 340A, N7022G, was destroyed when it was involved in an accident near Santee, California. The pilot and one person on the ground were fatally injured, and 2 people on the ground sustained serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Review of audio recordings from Southern California Terminal Radar Approach Control facilities and recorded ADS-B data revealed that at 1203:58, the controller broadcasted a weather update for Montgomery-Gibbs Executive Airport (MYF), which included a report that visibility was 10 miles, ceiling 1,700 ft broken, overcast at 2,800 ft, and runway 23 was in use.

At 1209:20, the controller issued instructions to the pilot to turn right to a 250° heading to join the final approach, which the pilot acknowledged, and ADS-B data showed the airplane at an altitude of 3,900 ft mean sea level (msl). About 28 seconds later, the pilot queried the controller if he was cleared for the ILS Runway 28R approach, with no response from the controller. At 1210:04, the controller told the pilot that he was 4 miles from the PENNY intersection and instructed him to descend to 2,800 ft until established on the localizer and cleared him for the ILS 28R approach before circling to land on runway 23, which the pilot partially read back. The controller reiterated the instruction to descend to 2,800 ft until the flight was established on the localizer, which the pilot acknowledged. At this time, the ADS-B data showed the airplane on a westerly heading at an altitude of 3,900 ft msl.

At 1211:19, the controller advised the pilot of traffic at their 2 o'clock position, 3 miles, southbound, at 5,000 ft and descending to 4,000 ft; the traffic reported was a C130 that was restricted above them, and the controller provided a caution about wake turbulence, which the pilot acknowledged while at an altitude of 2,550 ft. Immediately following the pilot's acknowledgement, the controller queried the pilot that it looked like he was drifting right of course and asked him if he was correcting, to which the pilot responded "I'm correcting, 22G." At 1211:45, the pilot said "SoCal, is 22G, VFR runway 23" at which time ADS-B data showed the airplane at 2,175 ft msl. The controller told the pilot he was not tracking on the localizer and canceled the approach clearance, followed by issuing instructions to climb and maintain 3,000 ft, followed by the issuance of a low altitude alert; the controller stated that the minimum vectoring altitude in the area was 2,800 ft. The pilot acknowledged the controller's instructions

shortly after. At this time, ADS-B data showed the airplane on a northwesterly heading at an altitude of 2,400 ft msl.

At 1212:12, the controller instructed the pilot to climb and maintain 3,800 and the pilot responded "3,800, 22G." ADS- B data showed that at this time the airplane was at 3,550 ft msl. About 9 seconds later, the controller issued the pilot instructions to turn right to 090° for vectors to final, to which the pilot responded "090 22G." At 1212:54, the controller instructed the pilot to turn right to 090° and climb immediately and maintain 4,000 ft. The pilot replied shortly after and acknowledged the controller's instructions. At this time, ADS-B data showed the airplane at an altitude of 2,500 ft msl, on a north-northeast heading. About 3 seconds after the pilot's response, the controller told the pilot that it looked like he was descending and that he needed to make sure he was climbing, followed by an acknowledgment from the pilot.

At 1213:35, the controller queried the pilot about his altitude; the pilot responded, "2,500 ft., 22G." The controller subsequently issued a low altitude alert and advised the pilot to expedite the climb to 5,000 ft. No further communication was received from the pilot despite multiple queries from the controller.

ADS-B data showed that the airplane had begun to climb at 1213:39, from 2,550 ft msl. The airplane continued a climb ascent while turning from a northeasterly-easterly heading and reached a maximum altitude of 3,500 ft msl, where it remained for about 4 seconds before it began a descending right turn. The airplane remained in the right descending turn until the last recorded target at 900 ft msl, located about 1,333 ft northwest of the accident site.

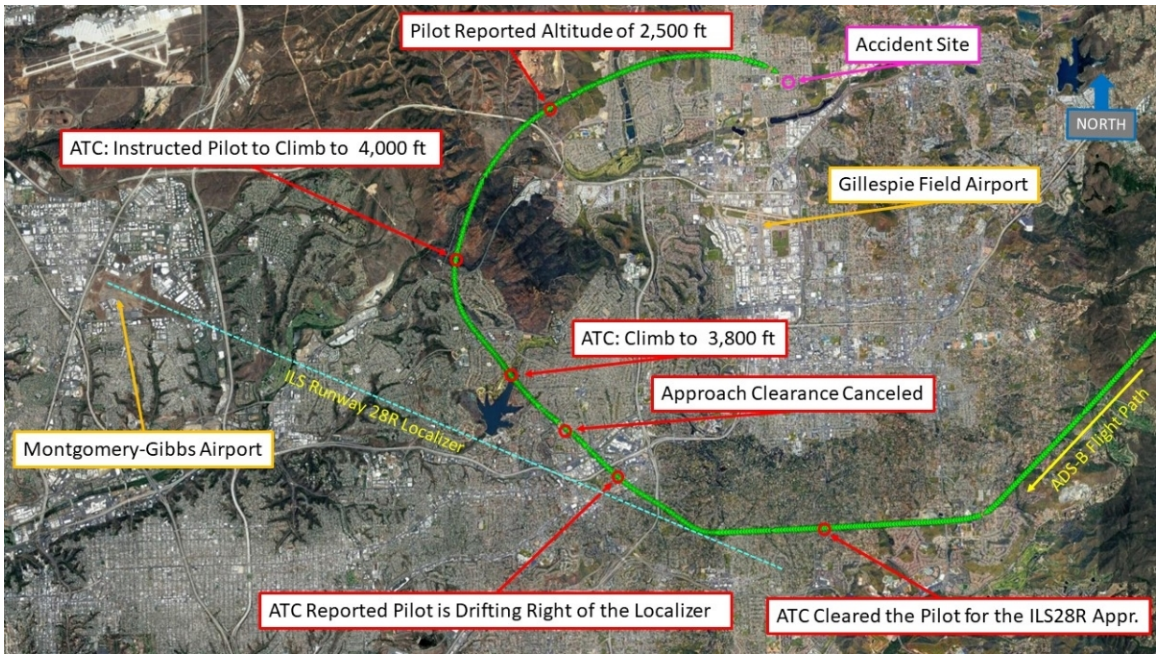

Figure 1: ADS-B data with ATC communication points noted.

Multiple witnesses located near the accident site reported hearing or seeing the accident airplane in a right-wing-low descent. One witness, who held a private pilot certificate, reported

that he heard the engines for about 3 seconds, and that they sounded like they were at a high-power setting, or “over-revving.” The witness also noted that at the time of the accident there was an overcast cloud layer about 1,900 ft msl.

One witness, who was flying a helicopter, reported that while they were inbound for Gillespie Airport (SEE), El Cajon, California, they were informed by the tower controller about an airplane eastbound, 1,100 ft above their altitude. The witness stated they obtained visual contact with the airplane, and saw it make an initial descent of a “few hundred feet” followed by a rapid nose-down descent in a right-wing-low attitude.

Pilot Information

Certificate:	Commercial	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	August 1, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 27, 2021
Flight Time:	1566.2 hours (Total, all aircraft), 1169.8 hours (Pilot In Command, all aircraft), 51.8 hours (Last 90 days, all aircraft), 26.9 hours (Last 30 days, all aircraft)		

One of the pilot’s logbooks, which contained previous flight experience from May 4, 2018, to October 6, 2021, was provided during the investigation. The logbook showed that between November 13, 2018, and October 6, 2021, the pilot had logged 152.2 hours in the accident airplane, of which, 8.2 hours were in instrument meteorological conditions and included 48 instrument approaches. No reference to a circle to land maneuver following an instrument approach was located within the provided logbook.

The pilot’s most recent flight review and instrument proficiency check was completed on August 27, 2021. The logbook entry indicated that the flight was 0.7 hours in length, and included 0.7 hours of dual instruction received, 2 instrument approaches, and 3 landings.

No reference of specific training regarding the recent Garmin avionics that were recently installed in the accident airplane was observed within the provided logbook. However, a magazine article, dated November 2019, noted that the pilot had owned other airplanes that were equipped with a different brand of advanced avionics than those installed in the accident make/model airplane.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7022G
Model/Series:	340A	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	340A0695
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	November 6, 2020 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	2627.3 Hrs as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-NB
Registered Owner:	SAMARTH AVIATION LLC	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Maintenance records for the airplane showed that on November 6, 2020, the following avionics were installed: Garmin GI275, Garmin GFC600 autopilot, Garmin GTN 650, Garmin GTN 750 Xi, and a Garmin G500 TXi; at the time of installation the airplane had a HOBBS time of 2,629 hours. The most recent maintenance performed on the airplane was an oil change, conducted on August 5, 2021, at a HOBBS time of 2,734.5 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSEE,387 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	11:55 Local	**Direction from Accident Site:**	194°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 2700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 17 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.8 inches Hg	**Temperature/Dew Point:**	19°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Yuma, AZ (YUM)	**Type of Flight Plan Filed:**	IFR
Destination:	San Diego, CA (MYF)	**Type of Clearance:**	IFR
Departure Time:	11:21 Local	**Type of Airspace:**	Class E

The closest weather reporting facility to the accident site was from Gillespie Field Airport (SEE), El Cajon, California, located 1.8 miles south of the accident site. The airport listed an elevation of 386 ft. In part, at 1155, SEE recorded a broken cloud ceiling at 2,700 ft agl.

At 1153, recorded weather conditions at the Montgomery-Gibbs Executive Airport (MYF), San Diego, California, located 9 miles west-southwest of the accident site at an elevation of 427 ft msl, included, in part, ceilings broken at 1,700 ft agl, overcast at 2,800 ft.

Airport Information

Airport:	Montgomery-Gibbs Executive Airport KMYF	**Runway Surface Type:**	
Airport Elevation:	427 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	Circling;ILS
Runway Length/Width:		**VFR Approach/Landing:**	None

Montgomery-Gibbs Executive Airport operates under Class-D airspace and was equipped with 3 runways (runway 28R/10L, 28L/10R, and 05/23). Runway 28R featured an ILS and Localizer instrument approach. Runway 28R also had a GPS instrument approach.

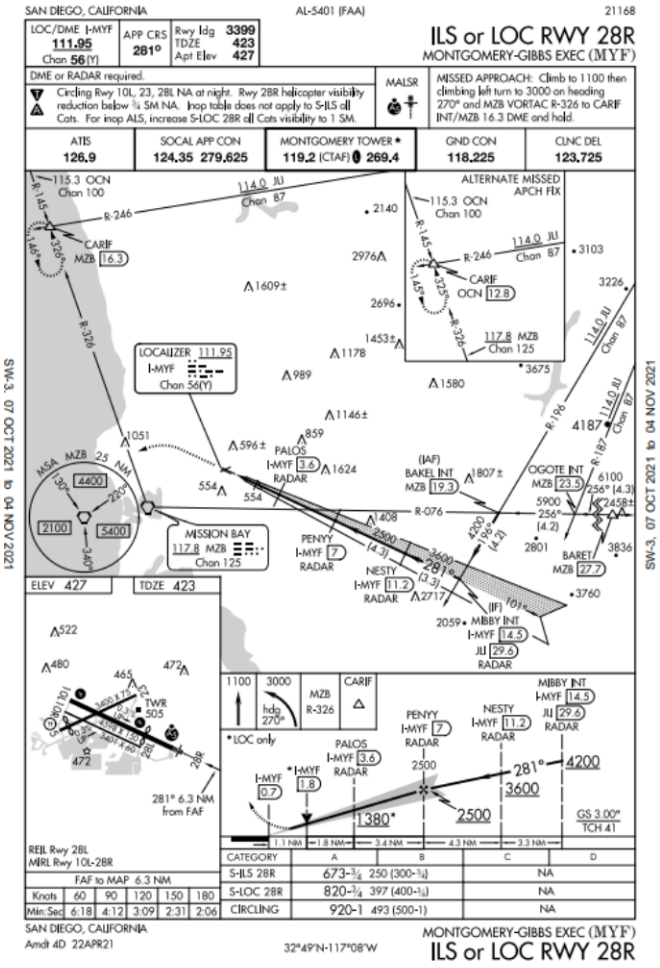

Figure 2: ILS / Localizer approach plate for Runway 28R at Montgomery - Gibbs Executive Airport.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	1 Fatal, 2 Serious	**Aircraft Explosion:**	Unknown
Total Injuries:	2 Fatal, 2 Serious	**Latitude, Longitude:**	32.85702,-116.96358

Examination of the accident site revealed that the airplane impacted a residential street on a heading of about 113° magnetic. The debris path, which consisted of various airplane, vehicle, and residential structure debris, was about 475 ft long and 400 ft wide, oriented on a heading of about 132°. Numerous residential structures exhibited impact related damage and or fire damage.

Figure 3: Annotations of wreckage locations. Aerial photo provided by San Diego County Sheriff.

The first identified point of contact (FIPC) was a gouge in the asphalt road about 10 inches long and 5 inches wide. Scrape marks extended from about 18 ft from the FIPC to a second gouge in the asphalt, which was about 2 ft wide and 3 ft long, along with a damaged vehicle. Adjacent to the second scrape mark and vehicle was an additional gouge in the asphalt, about 2 ft long and 4 inches wide. Additional scrape marks extended 28 ft to a large impact crater within the asphalt, which was about 4 ft wide, 3 ft long, and about 6 inches deep, and contained a portion of propeller blade. Additional scratch marks extended another 12 ft to portions of red lens consistent with the left wing navigation lens.

Figure 4: Initial impact area.

Examination of the main wreckage revealed that the fuselage and wings were located within the main wreckage and exhibited extensive fire damage and fragmentation throughout. Both engines were separated from their respective mounts. The empennage exhibited extensive crushing throughout. The left horizontal stabilizer was impact damaged and the left elevator was separated and located adjacent to the main wreckage within the debris path. The right horizontal stabilizer was impact damaged and was torn open from the leading edge aft about 30 to 40 inches from the outboard tip. The right elevator was separated. About 50 inches of the outboard right elevator was located within the debris area; however, the inboard portion of the right elevator and trim tab were not located. The vertical stabilizer and rudder remained attached to the empennage structure and exhibited impact damage.

Control continuity was established from the elevator bellcrank to the cockpit control bellcrank. One control cable exhibited signatures consistent with overload separation. Rudder control continuity was established from the rudder bellcrank to the rudder pedals. One control cable exhibited signatures consistent with overload separation. Aileron control continuity on both wings was established from the aileron bellcrank inboard with overload separations in the cables. Continuity from the aileron cable separations inboard to the control column was not able to be obtained at the accident site due to impact damage. Multiple flap hinges and flap surfaces were observed throughout the debris path. All 3 main landing gear were observed separated from the airframe. Gear position could not be determined.

Elevator and rudder trim actuators were located and measured, with both found in the neutral position.

Examination of the recovered wreckage revealed that all major structural components were recovered. Remains of all primary flight controls were also located within the recovered debris.

Primary flight control cables were located within the recovered wreckage. Segments of cable chains were located. All separations within the cables were consistent with tension overload.

Both of the recovered engines exhibited extensive impact damage. Visual and mechanical continuity was established throughout both engines.

The propeller assemblies were located within the recovered debris. One propeller assembly had the remains of one blade still connected to the hub and exhibited bending opposite of the direction of rotation, with blade separation about mid span. The remaining 2 blades were separated at the hub. The second propeller assembly had 2 blades that remained attached to the propeller hub. One propeller blade was bent opposite of the direction of rotation and curled almost 360°. The propeller blade tip was separated. The remaining propeller blade that was attached to the propeller hub was impact damaged and separated about mid blade. Propeller blade fragments were located throughout the recovered wreckage and exhibited various degrees of chordwise scratching, blade twisting, and curling along with leading edge and trailing edge gouges.

Postaccident examination of the engines revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

Medical and Pathological Information

An autopsy of the pilot was performed by the San Diego County Medical Examiner, San Diego, California, which listed the cause of death as “multiple blunt force injuries.” Autopsy evaluation for natural disease was extremely limited by the severity of injury.

Toxicology testing performed at the FAA Forensic Sciences Laboratory found no drugs of abuse.

Additional Information

Spatial Disorientation

The Federal Aviation Administration's (FAA) Airplane Flying Handbook (FAA-H-8083-3B) described some hazards associated with flying when the ground or horizon are obscured. The handbook states, in part, the following:

The vestibular sense (motion sensing by the inner ear) in particular can and will confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in airplane attitude, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated, leading the pilot to believe the attitude of the airplane has changed when, in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation.

Administrative Information

Investigator In Charge (IIC):	Cawthra, Joshua
Additional Participating Persons:	Ricardo Asensio; Textron Aviation; Wichita, KS Thomas Shaw; Federal Aviation Adminsitration; San Diego, CA
Original Publish Date:	November 8, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=104080