Aviation Investigation Final Report

Location:	Atlantic Ocean, Atlantic Ocean	**Accident Number:**	ERA19LA093
Date & Time:	February 1, 2019, 13:15 Local	**Registration:**	N3016L
Aircraft:	Piper PA32RT	**Aircraft Damage:**	Destroyed
Defining Event:	Inflight upset	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot departed under visual flight rules before obtaining an instrument flight rules (IFR) clearance from air traffic control into an area of moderate rain showers and thunderstorms over the open ocean. A review of radar and voice communication data revealed the pilot struggled to maintain assigned headings throughout the duration of the flight. When queried by air traffic control, the pilot stated that the wind was "squirrely," and later stated that the heading deviations were the result of autopilot and instrument issues; however, the pilot declared that he was "fine" and declined offers of assistance from air traffic control. The directional changes became increasingly divergent until the radar track depicted a rapid, tightening, descending right turn, during which radar contact was lost. The wreckage was not located after the accident despite a search undertaken by air and sea assets, thus the wreckage could not be examined.

The precipitation and restricted visibility conditions present in the area at the time of the accident were conducive to the development of spatial disorientation. The airplane's erratic flight track, which included directional changes inconsistent with progress toward the destination, and the rapidly descending right turn depicted on radar are consistent with the known effects of spatial disorientation. It is likely that the pilot's decision to initiate the flight into an area of restricted visibility and thunderstorms resulted in his loss of airplane control due to spatial disorientation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's loss of control due to spatial disorientation.

Findings

Personnel issues	Spatial disorientation - Pilot
Environmental issues	Thunderstorm - Effect on equipment

Factual Information

History of Flight

Maneuvering	Inflight upset (Defining event)

On February 1, 2019, about 1315 eastern standard time, a Piper PA-32RT-300, N3016L, was presumed destroyed after radar contact was lost over the Atlantic Ocean. The private pilot and passenger were presumed fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

A review of voice, radar, and weather data revealed that the airplane departed Palm Beach County Park Airport (LNA), West Palm Beach, Florida, under visual flight rules about 1300. The pilot subsequently obtained an instrument flight rules (IFR) clearance to Leonard M. Thompson International Airport (MYAM), Marsh Harbour, The Bahamas. The controller cleared the airplane to progressively higher altitudes and provided vectors to avoid areas of precipitation in its flight path. About 1305, the controller instructed the pilot to fly heading 080° to avoid weather and described an area of light and moderate precipitation at the pilot's eleven o'clock position and 10 miles ahead. The pilot acknowledged. About 2 minutes later, the controller instructed the pilot to turn 10° to the right in order to stay away from the precipitation.

About 1309, the controller instructed the pilot to turn another 10° right to remain clear of precipitation. The pilot read back the instructions and said, "I don't know what happened my autopilot it just kicked off." The controller acknowledged the pilot and instructed him to climb and maintain 6,000 ft; the pilot repeated the altitude assignment.

About 1310, the controller again instructed the pilot to turn 10° right for weather and stated that the airplane did not appear to be on the correct heading. The pilot stated that he was "really fighting" to maintain heading. One minute later, the controller informed the pilot that the airplane had turned south and asked if he required assistance. The pilot replied, "it's just really squirrelly up here it's weird."

About 1312, the pilot contacted the controller and stated that there were some "really weird winds up here." The controller advised that the airplane was turning north toward an area of heavier precipitation and instructed the pilot to turn south toward "any heading." The pilot stated that the airplane was having autopilot issues and that he was going to turn off the autopilot and fly manually.

About 1313, the controller advised the pilot that it appeared the airplane was heading eastbound and instructed him to maintain 6,000 ft. The controller also stated that he would advise the center controller that the airplane was having "some sort of an autopilot issue."

About 1314, the controller advised the pilot that the airplane had turned back to the northwest and asked the pilot if he was going to return to an eastbound heading. The pilot responded that he was "fine," that his instruments were "acting really goofy" and that he would turn the airplane to a 090° heading. The controller instructed the pilot to maintain 6,000 ft and no higher than 7,000 ft. The pilot did not respond.

Shortly thereafter, the airplane entered a sharp right turn from a northerly heading and began to descend. The radar track showed the airplane in an increasingly steep right turn as it rapidly descended and was lost from radar about 1315 in an area that depicted heavy precipitation.

The United States Coast Guard conducted a search for the airplane by air and sea over an area of 1,115 square miles without success. After 36 hours, the search was suspended on February 3, 2019.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	March 2, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1452 hours (Total, all aircraft), 400 hours (Total, this make and model)		

The pilot's personal logbook was not recovered, and neither his total instrument flight experience nor the recency of that experience could be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3016L
Model/Series:	PA32RT 300	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7985068
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	April 2, 2018 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3846.7 Hrs as of last inspection	**Engine Manufacturer:**	Lycoiming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-K1G5D
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PBI,20 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:		**Direction from Accident Site:**	270°
Lowest Cloud Condition:		**Visibility**	
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.18 inches Hg	**Temperature/Dew Point:**	21°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	West Palm Beach, FL (LNA)	**Type of Flight Plan Filed:**	IFR
Destination:	Marsh Harbour, AOBF (MHH)	**Type of Clearance:**	IFR
Departure Time:	13:00 Local	**Type of Airspace:**	Class C

The accident pilot received a weather briefing through Leidos Flight Service at 1200. The briefer provided the convective outlook, Center Weather Advisory, METARs, and winds aloft. The accident pilot asked about the line of weather off the coast and stated that if it was moving north, he would fly south of it. The briefer responded that the line of weather was "just sitting there." The accident pilot told the briefer he "saw that one little red blob out there."

The approximate cloud-top heights over the accident site were 16,000 ft mean sea level (msl), and a National Weather Service National Composite Radar Mosaic for 1315 at the approximate location of the accident site depicted 35- to 55-decibel (dBZ) echoes above the accident site.

Radar data indicated that the airplane first entered precipitation between 1303 and 1309; reflectivity values between 30 and 50 dBZ, or moderate to heavy rain intensity echoes, were located above the accident site at the accident time (See figure 1). The reflectivity bands were moving from south to north.

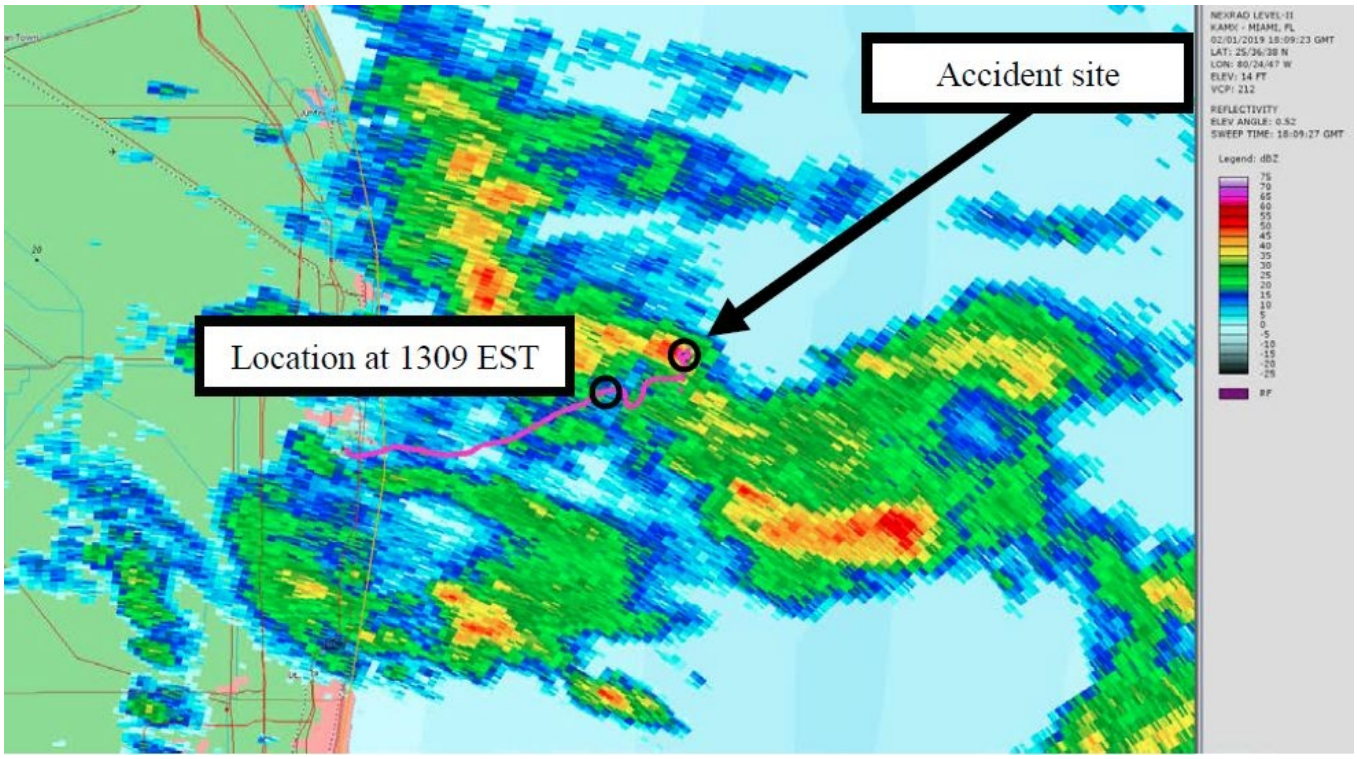

Figure 1. KAMX WSR-88D 0.5° elevation scan initiated at 1309:27 with the accident site marked with a black circle, the accident flight track in pink

The Center Weather Advisory valid for the accident site at the accident time warned of areas of moderate rain showers and isolated thunderstorms with heavy precipitation with tops to 28,000 ft.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	37.634956,-72.86087(est)

Additional Information

The FAA Civil Aeromedical Institute's publication, "Introduction to Aviation Physiology," defines spatial disorientation as a loss of proper bearings or a state of mental confusion as to position, location, or movement relative to the position of the earth. Factors contributing to spatial disorientation include changes in acceleration, flight in instrument meteorological conditions (IMC), frequent transfer between visual meteorological conditions (VMC) and IMC, and unperceived changes in aircraft attitude.

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

The vestibular sense (motion sensing by the inner ear) 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):	Rayner, Brian
Additional Participating Persons:	Patrick Hempen; FAA/AVP; Washington, DC Jonathon Hirsch; Piper; Vero Beach, FL
Original Publish Date:	September 23, 2020
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98936