



Aviation Investigation Final Report

Location:	Winter Haven, Florida	Accident Number:	ERA23FA142
Date & Time:	March 7, 2023, 14:00 Local	Registration:	N10510 (A1); N9221D (A2)
Aircraft:	Piper J3C (A1); Piper PA28 (A2)	Aircraft Damage:	Substantial (A1); Substantial (A2)
Defining Event:	Midair collision	Injuries:	2 Fatal (A1); 2 Fatal (A2)
Flight Conducted Under:	Part 91: General aviation - Instructional (A1); Part 91: General aviation - Instructional (A2)		

Analysis

A float-equipped J3C was returning to its seaplane base for a water landing after a local flight. A PA-28 was performing power-off 180° landing maneuvers at an airport adjacent to the seaplane base. Shortly after the PA-28 pilot announced a left turn to the base leg over the airport common traffic advisory frequency (CTAF), the airplanes collided nearly head-on at 465 ft above ground level.

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

The J3C was not equipped with a radio, nor was it required to be. With no radio in the J3C, neither they nor the crew in the PA-28 would have had any attentional cueing that would have alerted them to the other airplane. Neither airplane was equipped with avionics that would allow for an in-cockpit traffic display and only the PA-28 was equipped with ADS-B out.

Review of video evidence from a nearby residence revealed that, given the two flight paths and the nearly head-on impact, the front-seat pilot of the J3C and the right-seat flight instructor of the PA-28 should have been able to detect the other airplane. Both crews efforts to detect the other likely would have been made more difficult by the complex background of sky and ground.

The PA-28 flight instructor’s postaccident toxicology testing results indicated that she had used the antihistamine medication cetirizine. Based on the cetirizine levels measured in cavity

blood and tissue, it is possible that she may have been experiencing some associated sedation at the time of the accident. Although sedation can adversely affect vigilance, there is no clear evidence that this was a factor in the collision, which plausibly could have occurred in the absence of impairment.

Ethanol was detected at a very low level in a postmortem cavity blood specimen from the PA-28 pilot receiving instruction. Ethanol was not detected in his urine. These results indicate that some or all of the detected ethanol may have been from postmortem production, and that ethanol effects did not likely contribute to the accident.

The J3C was not equipped with a radio, nor was it required to be, and was therefore not self-announcing or able to receive transmissions on CTAF. With no radio in the JC3, neither they nor the crew in the PA-28 would have had any attentional cueing that would have alerted them to the other airplane. Neither airplane was equipped with avionics that would allow for an in-cockpit traffic display and only the PA-28 was equipped with ADS-B out. Had both flight crews had access to two-way radios and in-cockpit traffic displays, with ADS-B in and out, they likely would have been better able to see and avoid the impending collision.

Probable Cause and Findings

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

The failure of both flight crews to see and avoid each other while operating in the airport environment.

Findings

Personnel issues (A1)	Monitoring other aircraft - Student/instructed pilot
Personnel issues (A1)	Monitoring other aircraft - Instructor/check pilot
Personnel issues (A1)	Monitoring other aircraft - Pilot of other aircraft
Personnel issues (A2)	Monitoring other aircraft - Student/instructed pilot
Personnel issues (A2)	Monitoring other aircraft - Instructor/check pilot
Personnel issues (A2)	Monitoring other aircraft - Pilot of other aircraft

Factual Information

History of Flight

Approach-VFR pattern base (A1)	Midair collision (Defining event)
Approach-VFR pattern base (A2)	Midair collision

On March 7, 2023, at 14:00 eastern standard time, a Piper J3C airplane, N10510, and a Piper PA-28-161 airplane, N9221D, collided in midair in Winter Haven, Florida. The flight instructor and pilot receiving instruction in each airplane were fatally injured. Both flights were operated as Title 14 *Code of Federal Regulations* Part 91 instructional flights.

According to the operator of the float-equipped J3C, the airplane was returning to Jack Brown's Seaplane Base (F57), Winter Haven, Florida for a water landing after a local flight. A witness reported the J3C was on a southerly heading, had just turned to a westerly direction, and appeared lower than the PA-28 just before the collision.

According to recorded CTAF radio transmissions and ADS-B data, the PA-28 departed from the airplane's home airport, Lakeland Linder International Airport (LAL), Lakeland, Florida. The flight proceeded to Winter Haven Regional Airport (GIF), Winter Haven, Florida, where the pilot receiving instruction was performing power-off 180° landing maneuvers to runway 29. The flight school chief pilot reported that the purpose of this flight was to practice power-off 180° landing maneuvers as the pilot receiving instruction had been graded unsatisfactory in the previous flight lesson. The maneuver during which the accident occurred was the fourth such maneuver. Shortly after the PA-28 pilot announced a left turn to the base leg of the traffic pattern, the airplanes collided nearly head-on. ADS-B data revealed that the collision occurred at an altitude about 575 ft mean sea level. Surveillance video footage showed neither airplane made altitude or heading changes immediately before the collision. The right wing of the PA-28 fractured during the collision and both airplanes impacted a lake east of the approach end of runway 29 at GIF.

Flight instructor Information (A1)

Certificate:	Airline transport; Commercial; Flight instructor	Age:	78, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land; Multi-engine sea	Seat Occupied:	Front
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Glider; Instrument airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	November 1, 2022
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	25000 hours (Total, all aircraft)		

Pilot Information (A1)

Certificate:	Commercial; Private	Age:	67, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Rear
Other Aircraft Rating(s):	None	Restraint Used:	Lap only
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	July 13, 2022
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	1029 hours (Total, all aircraft)		

Flight instructor Information (A2)

Certificate:	Commercial; Flight instructor	Age:	23, Female
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine	Toxicology Performed:	Yes
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	December 31, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	August 1, 2022
Flight Time:	489 hours (Total, all aircraft), 353 hours (Total, this make and model), 449 hours (Pilot In Command, all aircraft), 141 hours (Last 90 days, all aircraft)		

Pilot Information (A2)

Certificate:	Private	Age:	19, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 Waiver time limited special	Last FAA Medical Exam:	August 13, 2020
Occupational Pilot:	No	Last Flight Review or Equivalent:	March 3, 2022
Flight Time:	215 hours (Total, all aircraft), 90 hours (Total, this make and model), 165 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information (A1)

Aircraft Make:	Piper	Registration:	N10510
Model/Series:	J3C 65	Aircraft Category:	Airplane
Year of Manufacture:	1945	Amateur Built:	
Airworthiness Certificate:	Normal; Utility	Serial Number:	45-4942-A
Landing Gear Type:	None; Float	Seats:	2
Date/Type of Last Inspection:	January 10, 2023 Annual	Certified Max Gross Wt.:	1300 lbs
Time Since Last Inspection:	82.3 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	16542.8 Hrs as of last inspection	Engine Manufacturer:	Continental
ELT:	Not installed	Engine Model/Series:	C85-12
Registered Owner:	JACK BROWNS SEAPLANE BASE INC	Rated Power:	96 Horsepower
Operator:	JACK BROWNS SEAPLANE BASE INC	Operating Certificate(s) Held:	None

Aircraft and Owner/Operator Information (A2)

Aircraft Make:	Piper	Registration:	N9221D
Model/Series:	PA28 161	Aircraft Category:	Airplane
Year of Manufacture:	1988	Amateur Built:	
Airworthiness Certificate:	Normal; Utility	Serial Number:	2841030
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	February 17, 2023 Annual	Certified Max Gross Wt.:	2325 lbs
Time Since Last Inspection:	23 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	16509 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C91A installed, activated, did not aid in locating accident	Engine Model/Series:	O-320-D3G
Registered Owner:	ORMOND AIRCRAFT LEASING & MANAGEMENT INC	Rated Power:	160 Horsepower
Operator:	Sunrise Aviation, Inc	Operating Certificate(s) Held:	Pilot school (141)
Operator Does Business As:		Operator Designator Code:	FPQS

The white-and-red-colored Piper PA-28 was a single-engine, low-wing airplane. It was equipped with a rotating beacon light, anticollision strobe lights, navigation position lights, and a landing light. The operational status of each lighting system at the time of the accident could not be determined. A review of the airworthiness file for the PA-28 revealed that the airplane received its original airworthiness certificate December 12, 1988. The record also showed that it was not equipped with an active traffic system that was interfaced to the electronic cockpit instruments, such as ADS-B in. This was confirmed during postaccident examination, which found no avionics compatible with an in-cockpit traffic display. The airplane was equipped with ADS-B out and a two-way communications radio.

The yellow-colored Piper J3C was a single-engine, high-wing airplane. A review of the airworthiness file for the J3C revealed that the airplane received its original airworthiness certificate July 18, 1956. Postaccident examination found the airplane was not equipped with ADS-B in or out, a two-way radio, or any avionics that would support an in-cockpit traffic display, nor was it required to be.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	GIF,146 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	13:53 Local	Direction from Accident Site:	309°
Lowest Cloud Condition:	Few / 4100 ft AGL	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	10 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.01 inches Hg	Temperature/Dew Point:	28°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Winter Haven , FL (F57) (A1); Lakeland, FL (LAL) (A2)	Type of Flight Plan Filed:	None (A1); None (A2)
Destination:	Winter Haven , FL (F57) (A1); Lakeland, FL (LAL) (A2)	Type of Clearance:	None (A1); None (A2)
Departure Time:	13:05 Local (A1); 13:27 Local (A2)	Type of Airspace:	Class G (A1); Class G (A2)

Airport Information

Airport:	WINTER HAVEN RGNL GIF	Runway Surface Type:	Asphalt
Airport Elevation:	145 ft msl	Runway Surface Condition:	Dry
Runway Used:	29	IFR Approach:	None
Runway Length/Width:	4001 ft / 60 ft	VFR Approach/Landing:	Go around;Simulated forced landing;Traffic pattern

Winter Haven Regional Airport is a non-towered, class G airport collocated with Jack Browns Seaplane Base (F57), Winter Haven, FL, located about 500 ft south of the runway 11 threshold on the north shore of Lake Jessie. The airport had a CTAF and automated surface weather observation station, which were operational at the time of the accident. Following this accident, the chart supplement for the airport was updated to include the following in the airport remarks section: "Nmrs acft operg w/o RDOs invof arpt and SPB."

Wreckage and Impact Information (A1)

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	28.055456,-81.740814

Wreckage and Impact Information (A2)

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	28.055456,-81.740814

All major portions of both airplanes, except for the right wing and aileron of the PA-28, were recovered from the lake. Examination of the Piper PA-28 revealed impact damage to the forward fuselage and wings. The cabin door was impact separated forward of its hinge attachment points. The right wing was separated from the airplane in the wing root area. A 50-inch section of the inboard portion of the right wing was recovered with a 37-inch portion of the flap attached by two hinges. A 48-inch piece of the right flap was impact separated and recovered; however, the rest of the outboard portion of the right wing was not recovered. There was significant hard body impact damage and fragmentation to the leading edge and wing structure at the outboard separation point.

Examination of the J3C revealed that the fuselage and empennage remained intact; however, the inboard lower corner of the right float was crushed along a 30-inch span beginning about 28 inches aft of the bumper, with impact scars along the longitudinal axis of the float. An 87-inch span of the chine and inboard sister keelson were torn away 52 to 139 inches aft of the bumper, leaving a 6 to 8-inch opening in the float hull. The bulkheads adjacent to this missing section were impact-displaced aft.

Examination of both airframes and engines revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation of the airplanes.

Medical and Pathological Information

The Office of the District Medical Examiner 10th Judicial Circuit of Florida ruled the cause of death for all occupants as multiple blunt force traumatic injuries and the manner of death for all occupants as accident.

The Federal Aviation Administration (FAA) Forensic Sciences Laboratory performed toxicological testing of postmortem specimens from the PA-28 flight instructor. Cetirizine was detected at 95 ng/mL in cavity blood and at 645 ng/mL in liver tissue. Cetirizine is a second-generation antihistamine medication that is available over the counter and is commonly used to treat allergy symptoms. Cetirizine often carries a warning that users may experience drowsiness and should be careful when driving a motor vehicle or operating machinery. Data on sedation and psychomotor impairment from cetirizine are mixed, with some studies finding some sedating and impairing effects. The FAA states that pilots should wait 48 hours after using cetirizine before flying, to allow time for the drug to be cleared from circulation.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem specimens from the PA-28 pilot receiving instruction. Ethanol was detected at 0.011 g/dL in cavity blood and was not detected in urine. Fexofenadine and its metabolite azacyclonol were detected in cavity blood and liver tissue. Ethanol is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. FAA regulation imposes strict limits on flying after consuming ethanol, including a prohibition on piloting a civil aircraft while having a blood ethanol level of 0.04 g/dL or greater. Alcohol consumption is not the only possible source of ethanol in postmortem specimens. Ethanol may sometimes be produced by microbes in a person's body after death, potentially elevating ethanol levels in some postmortem specimens but not others. Fexofenadine is an over-the-counter non-sedating antihistamine commonly used to relieve symptoms of seasonal and environmental allergies. Fexofenadine is not generally considered impairing.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem specimens from the J3C flight instructor. No tested-for substances were detected.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem specimens from the J3C pilot receiving instruction. Metoprolol was detected in heart blood and liver tissue. Pravastatin was detected in liver tissue and was not detected in heart blood. Metoprolol is a prescription medication that can be used as part of treatment for high blood pressure, certain arrhythmias, and certain types of heart failure. Pravastatin is a prescription medication commonly used to control cholesterol and reduce cardiovascular risk. Metoprolol and pravastatin are not generally considered impairing.

Tests and Research

A video study of surveillance footage that captured the accident was conducted by the National Transportation Safety Board's Office of Research and Engineering. The study was able to estimate the location, speed, and altitude of the J3C. The study showed that the ground speed of the J3C at the time of collision was about 46 knots. The ground speed of the PA-28 at the time of collision, based on ADS-B data, was about 80 knots. Based on the altitude of the J3C 5 seconds before collision, its descent rate was 456 ft/minute and the descent rate of the PA-28 during the 5 seconds was 792 ft/minute. The study found the collision occurred at 465 ft above ground level, near head-on.

Additional Information

See and Avoid Concept

Title 14 CFR 91.113 addresses aircraft right-of-way rules and states, in part, the following:

(b) General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft.

The FAA's Aeronautical Information Manual (AIM), dated September 5, 2024, paragraph 5-5-8, includes pilot procedures for see-and-avoid while in flight and states, "When meteorological conditions permit, regardless of type of flight plan or whether or not under control of a radar facility, the pilot is responsible to see and avoid other traffic, terrain, or obstacles."

The AIM, paragraph 4-1-9, also describes operations to/from airports without an operating control tower and the use of a common traffic advisory frequency (CTAF) and states, in part, the following:

a. Airport Operations Without Operating Control Tower

1. There is no substitute for alertness while in the vicinity of an airport. It is essential that pilots be alert and look for other traffic and exchange traffic information when approaching or departing an airport without an operating control tower. This is of particular importance since other aircraft may not have communication capability or, in some cases, pilots may not communicate their presence or intentions when operating into or out of such airports. To achieve the greatest degree of safety, it is essential that all radio-equipped aircraft transmit/receive on a common frequency identified for the purpose of airport advisories.

The Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25C), chapter 14, addresses scanning procedures for visually acquiring traffic:

The pilot can contribute to collision avoidance by being alert and scanning for other aircraft. This is particularly important in the vicinity of an airport.

Effective scanning is accomplished with a series of short, regularly spaced eye movements that bring successive areas of the sky into the central visual field. Each movement should not exceed 10°, and each should be observed for at least 1 second to enable detection. Although back and forth eye movements seem preferred by most pilots, each pilot should develop a scanning pattern that is most comfortable and then adhere to it to assure optimum scanning. Even if entitled to the right-of-way, a pilot should yield if another aircraft seems too close.

The AIM 4-5-6 discusses traffic information services (TIS) which provides information to the cockpit via data link, which is like VFR radar traffic advisories normally received over voice radio:

TIS is intended to improve the safety and efficiency of "see and avoid" flight through an automatic display that informs the pilot of nearby traffic and potential conflict situations.

TIS alert status messages identify a potential collision hazard within 34 seconds. This alert may be visual and/or audible, such as a flashing display symbol or a headset tone. A target is a threat if the time to the closest approach in vertical and horizontal coordinates is less than 30 seconds and the closest approach is expected to be within 500 feet vertically and 0.5 nautical miles laterally.

Preventing Similar Accidents

Prevent Midair Collisions (SA-058)

The Problem

The "see-and-avoid" concept has long been the foundation of midair collision prevention. However, the inherent limitations of this concept, including human limitations, environmental conditions, aircraft blind spots, and operational distractions, leave even the most diligent pilot vulnerable to the threat of a midair collision with an unseen aircraft. Technologies in the

cockpit that display or alert of traffic conflicts, such as traffic advisory systems and automatic dependent surveillance–broadcast (ADS-B), can help pilots become aware of and maintain separation from nearby aircraft. Such systems can augment reality and help compensate for the limitations of visually searching for traffic.

What can you do?

- Educate yourself about the benefits of flying an aircraft equipped with technologies that aid in collision avoidance. Whether you are flying in congested airspace or a remote location, a cockpit display or alert of traffic information will increase your awareness of surrounding traffic.
- Become familiar with the symbology, display controls, alerting criteria, and limitations of such technologies in your aircraft, whether the systems are portable or installed in the cockpit. High-density traffic around airports can make interpreting a traffic display challenging due to display clutter, false traffic alerts, and system limitations.
- Use information provided by such technologies to separate your aircraft from traffic before aggressive, evasive maneuvering is required. Often, slight changes in rate of climb or descent, altitude, or direction can significantly reduce the risk of a midair collision long before the conflicting aircraft has been seen.
- Remember that while such technologies can significantly enhance your awareness of traffic around you, unless your system is also capable of providing resolution advisories, visual acquisition of and separation from traffic is your primary means of collision avoidance (when weather conditions allow).

See <https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-058.pdf> for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Young, Joshua
Additional Participating Persons:	Cory Best; FAA/FSDO; Orlando, FL Devon Dorato; Sunrise Aviation; Ormond Beach, FL Ben Shipps; Jack Browns Seaplane Base; Winter Haven, FL
Original Publish Date:	February 5, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=106845

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).