Aviation Investigation Final Report

Location:	Chandler, Arizona	**Accident Number:**	WPR22FA001
Date & Time:	October 1, 2021, 07:40 Local	**Registration:**	N412TL (A1); N2868H (A2)
Aircraft:	ROBINSON HELICOPTER COMPANY R22 (A1); Piper PA-28-181 (A2)	**Aircraft Damage:**	Substantial (A1); Minor (A2)
Defining Event:	Midair collision	**Injuries:**	2 Fatal (A1); 2 None (A2)
Flight Conducted Under:	Part 91: General aviation - Instructional (A1); Part 91: General aviation - Instructional (A2)		

Analysis

A low-wing airplane and a helicopter, both of which were operating as instructional flights with flight instructors onboard, were performing takeoffs and landings at the tower-controlled airport in day visual meteorological conditions. The helicopter was performing right traffic patterns to the taxiway that paralleled the runway, while the airplane was performing right traffic patterns, outside of and above the helicopter pattern, to the runway. The helicopter had been cleared for “the option” to the taxiway, while the airplane was cleared to land shortly thereafter.

After receiving landing clearance, the instructor onboard the airplane elected to conduct a simulated engine failure to a full-stop landing, reducing the engine power to idle abeam the approach end of the runway, but did not advise the tower controller of his intentions. While on final approach, the instructor took control of the airplane and entered a forward slip. The instructor and student then heard and felt a loud “bang” and the instructor declared an emergency, thinking that the airplane had impacted birds.

Flight track information, witness statements, and damage to the airplane indicated that the airplane descended into the helicopter while both aircraft were on final approach for landing. Review of tower control communications indicated that the accident airplane had been advised and was aware of helicopters operating to the parallel taxiway. The tower controller cleared the airplane to land behind a twin-engine airplane, and advised of a helicopter low and to the airplane's right (the accident helicopter). The circumstances of the accident are consistent with the failure of the pilots onboard the airplane to see and avoid the helicopter

during landing approach, resulting in a collision with the helicopter. It is possible that the airplane's low-wing configuration and steep descent while in the forward slip may have contributed to the pilots' failure to see the helicopter below them.

Probable Cause and Findings

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

The failure of the pilots onboard the airplane to see and avoid the helicopter while maneuvering in the traffic pattern, which resulted in a midair collision.

Findings

Aircraft (A1)	Descent rate - Related operating info
Aircraft (A2)	Descent/approach/glide path - Incorrect use/operation
Personnel issues (A2)	Monitoring other aircraft - Flight crew
Personnel issues (A2)	Aircraft control - Flight crew

Factual Information

History of Flight

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

On October 1, 2021, about 0740 mountain standard time, a Piper PA-28-181 airplane, N2868H, and a Robinson Helicopter Company R22 helicopter, N412TL, were involved in a midair collision near Chandler, Arizona. The airplane sustained minor damage and the flight instructor and student pilot onboard were not injured. The flight instructor and student pilot onboard the helicopter were fatally injured, and the helicopter was destroyed. Both aircraft were operated as Title 14 *Code of Federal Regulations* Part 91 instructional flights.

The flight instructor and student on board the airplane requested and received clearance from the tower controller to perform takeoffs and landings from runway 4L, remaining in the airport traffic pattern. After completing three touch-and-go landings, the tower controller instructed the airplane to switch to runway 4R and issued a frequency change. The instructor and student continued to perform touch-and-go takeoffs and landings from runway 4R, and the instructor recalled the controller requesting that the airplane extend their crosswind leg for helicopter traffic during one of their patterns.

During the accident approach, the airplane was cleared for landing behind a twin-engine airplane. The instructor stated that he scanned the area for traffic, and abeam the runway numbers on the downwind leg of the traffic pattern, reduced engine power to idle to simulate a loss of engine power. On final approach for landing, the instructor took control of the airplane to demonstrate a slip and they heard and felt a loud bang. The instructor declared an emergency, thinking that the airplane had hit birds. During the landing flare, the flight instructor noticed the left wing continued to descend and used aileron inputs to keep the wing up. After the airplane touched down, it veered left and exited the runway before it came to a stop between runway 04R and 04L. Once the airplane came to a stop, he and the student pilot exited the airplane.

Witnesses reported that an airplane on final approach descended on top of a helicopter and impacted the helicopter's main rotor blades. The helicopter descended, impacted terrain, and a post-impact fire ensued.

Review of air traffic control communications revealed that, about 0732, the accident airplane was advised to extend the upwind leg for helicopters operating in the parallel taxiway pattern; one of the pilots acknowledged. About 737:06, the accident helicopter was cleared to land on

the taxiway. At 0737:52, the controller cleared the airplane to land behind the twin-engine airplane, and also stated that a helicopter was present at low level, ahead of the airplane to the right, proceeding southbound. The accident airplane acknowledged. At 0740:41, the instructor onboard the airplane declared an emergency following the collision.

Recorded Automatic Dependent Surveillance-Broadcast (ADS-B) data provided by the Federal Aviation Administration (FAA) showed that both aircraft appeared to be on a base to final turn, with the airplane on the approach to runway 04R and the helicopter on the approach to taxiway C (parallel to and to the right of runway 04R). The data showed that the flight paths of the aircraft intersected about 0740:15 at an altitude of about 1,400 ft mean sea level (msl), as seen in Figure 1.

Figure 1. View of helicopter and airplane ADS-B flight track data

Flight instructor Information (A1)

Certificate:	Commercial; Flight instructor	**Age:**	27,Female
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	August 27, 2021
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 25, 2021
Flight Time:	(Estimated) 566 hours (Total, all aircraft), 513 hours (Total, this make and model), 468 hours (Pilot In Command, all aircraft), 213 hours (Last 90 days, all aircraft), 88 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Student pilot Information (A1)

Certificate:	Student	**Age:**	34,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	June 7, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 26 hours (Total, all aircraft), 26 hours (Total, this make and model), 26 hours (Last 90 days, all aircraft), 21 hours (Last 30 days, all aircraft)		

Flight instructor Information (A2)

Certificate:	Commercial; Flight instructor	**Age:**	43,Male
Airplane Rating(s):	Single-engine land; Multi-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; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	January 4, 2021
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 23, 2021
Flight Time:	(Estimated) 425 hours (Total, all aircraft), 115 hours (Total, this make and model), 344 hours (Pilot In Command, all aircraft), 46 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Student pilot Information (A2)

Certificate:	Student	**Age:**	49,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	July 19, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 15 hours (Total, all aircraft), 15 hours (Total, this make and model), 14 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

At the time of the accident, the airplane flight instructor had accumulated about 425 total hours of flight experience, of which 32 hours were as a flight instructor.

Aircraft and Owner/Operator Information (A1)

Aircraft Make:	ROBINSON HELICOPTER COMPANY	**Registration:**	N412TL
Model/Series:	R22	**Aircraft Category:**	Helicopter
Year of Manufacture:	2015	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4689
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	September 28, 2021 100 hour	**Certified Max Gross Wt.:**	1370 lbs
Time Since Last Inspection:	14 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4775.3 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Not installed	**Engine Model/Series:**	O-360-J2A
Registered Owner:	DELTA LEASING INC DBA	**Rated Power:**	145 Horsepower
Operator:	Quantum Helicopters	**Operating Certificate(s) Held:**	Pilot school (141)

Aircraft and Owner/Operator Information (A2)

Aircraft Make:	Piper	**Registration:**	N2868H
Model/Series:	PA-28-181	**Aircraft Category:**	Airplane
Year of Manufacture:	1979	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	28-7990508
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 26, 2021 100 hour	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5509.7 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-360-4AM
Registered Owner:	FLIGHT OPERATIONS ACADEMY LLC	**Rated Power:**	
Operator:	FLIGHT OPERATIONS ACADEMY LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCHD,1243 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	06:47 Local	**Direction from Accident Site:**	267°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	20°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Chandler, AZ (A1); Chandler, AZ (A2)	**Type of Flight Plan Filed:**	None (A1); None (A2)
Destination:	Chandler, AZ (A1); Chandler, AZ (A2)	**Type of Clearance:**	VFR (A1); VFR (A2)
Departure Time:		**Type of Airspace:**	Class D (A1); Class D (A2)

Airport Information

Airport:	CHANDLER MUNI CHD	**Runway Surface Type:**	Asphalt
Airport Elevation:	1243 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	04R	**IFR Approach:**	None
Runway Length/Width:	4870 ft / 75 ft	**VFR Approach/Landing:**	Full stop

The Chandler Municipal Airport (CHD) FAA contract tower (FCT) had a Letter of Agreement (LOA), dated August 2020, with the helicopter operator that specified responsibilities, defined terms, and established the procedures for operations of helicopters within the CHD class D airspace. The provision of the letter applied only to helicopters conducting operations by persons authorized by the helicopter operator and only when CHD control tower was in operation. The LOA established a helicopter traffic pattern to taxiway C. (see Figure 2.) The helicopter traffic pattern altitude was 1,900 ft msl and the fixed wing traffic pattern altitude was 2,300 ft msl.

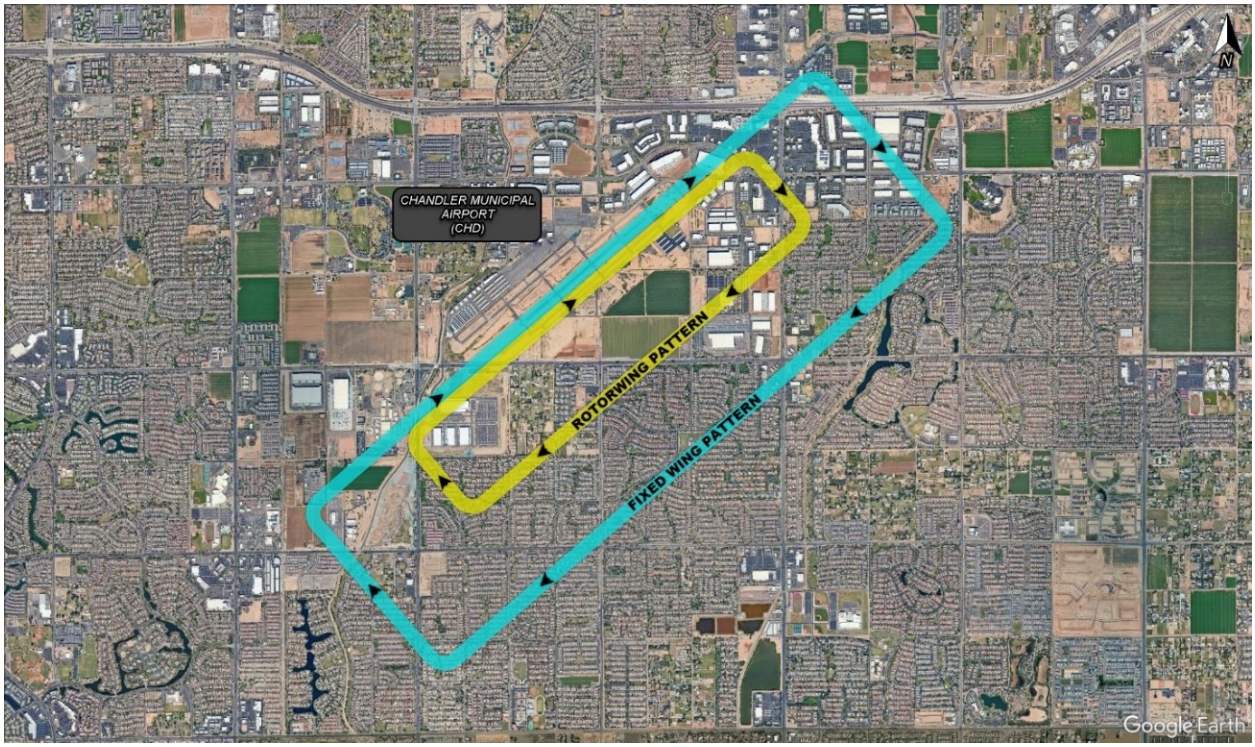

Figure 2. View of helicopter and airplane traffic pattern

Wreckage and Impact Information (A1)

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	33.269096,-111.81112(est)

Wreckage and Impact Information (A2)

Crew Injuries:	2 None	**Aircraft Damage:**	Minor
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	33.269096,-111.81112(est)

Examination of the airplane accident site revealed that the airplane came to rest upright on the dirt field between runways 04R and 04L, on a heading of about 345° magnetic. The helicopter impacted terrain about .5 mile southwest of the approach end of runway 04R.

Postaccident examination of the airplane did not reveal evidence of any mechanical anomalies that would have precluded normal operation. Flight control continuity was established from the cockpit to all primary flight controls. The airplane's nose landing gear and tire, as well as the left main landing gear, had separated from the airplane and were located near the helicopter wreckage. Both tires were cut consistent with contact from the helicopter's main rotor blades. A piece of the helicopter's canopy was found lodged in the hat channel on the underside of the airplane.

The helicopter came to rest on its left side on a heading of about 053° magnetic, at an elevation of 1,236 ft msl. No visible ground scars were observed surrounding the wreckage. All major structural components of the helicopter were located within about 15 ft of the main wreckage.

Postaccident examination of the helicopter was limited due to impact damage and post-crash fire.

Medical and Pathological Information

The Maricopa County Office of the Medical Examiner in Phoenix, Arizona, performed an autopsy of the helicopter flight instructor and student pilot. The flight instructor and student pilot's cause of death was multiple blunt impact injuries.

The helicopter flight instructor toxicology testing performed at the FAA Forensic Sciences Laboratory found no drugs of abuse.

The helicopter student pilot's toxicology testing performed by the FAA Forensic Sciences Laboratory detected amphetamine at 7 ng/ml in the student pilot's urine.

Amphetamine is a Schedule II controlled substance that stimulates the central nervous system. It is available by prescription for the treatment of attention deficit disorder and narcolepsy. It carries a boxed warning about its potential for abuse and has warnings about an increased risk of sudden death and the potential for mental health and behavioral changes. In some preparations, the prescription drug is metabolized to amphetamine; commonly marketed names include Adderall, Dexedrine, and Vyvanse. After a single 30 mg oral dose, early blood levels averaged 0.111 ug/ml and average blood levels in adults using the long-acting prescription orally for a week were about 0.065 ug/ml.

Administrative Information

Investigator In Charge (IIC):	Gutierrez, Eric
Additional Participating Persons:	Michael Moyer ; FAA; Scottsdale, AZ Kathryn Whitaker; Piper; Phoenix, AZ Hannah Warren; Robinson Helicopter Company; Torrance, CA
Original Publish Date:	September 29, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=104018