

# SAFETY GRAM 4.0

November 2019





## **SAFETY GRAM**

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### Case:

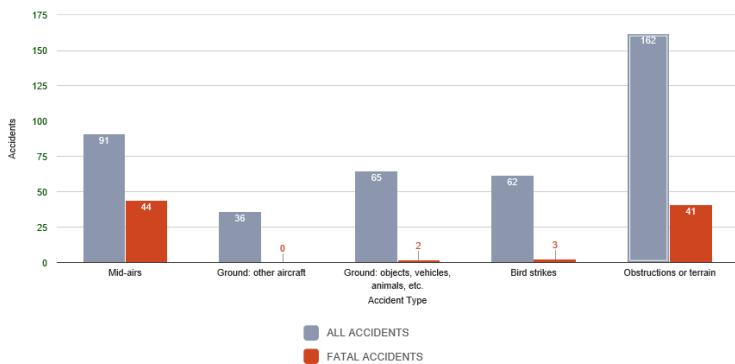
### **Reference NTSB Aviation Accident Report (8 Pages)**

### Discussion:

The accident report that I attached involved a good friend of mine in his C-170. We were attending the High Sierra Fly-In when he took off to go home and another plane, his friend flying home with him, took off in the wrong direction and collided with him at a 90 degree angle while he was on downwind. Unfortunately, the outcome was fatal for the pilots in both aircraft. This accident in particular had a profound impact on my life. I no longer look at traffic patterns as the "safe zone" but rather a place where I need to have heightened awareness. Because although you or I may be following correct procedures, other pilots may not be. It's not safe to assume you see everyone and they see you and/or that everyone is on the radio making proper position calls.

Mid-air collisions all involve pilot's inability to maintain visual separation between other aircraft. An Air Safety Institute study of mid-air collisions revealed that 49 percent

occurred in the traffic pattern, on approach to or departure from an airport, like the case study you reviewed. Of the other 51 percent, about half occurred during enroute climb, cruise, or descent, and the rest resulted from formation flights or other hazardous activities. Eighty percent of the midair collisions that occurred during "normal" flight activities happened within ten miles of an airport, and 78 percent of the



midair collisions that occurred around the traffic pattern happened at non-towered airports.

Bottom line, all pilots need to utilize proper "see and avoid" techniques" to avoid mid-air collisions. Do not become complacent in the pattern! Lastly, just say no to drugs! The

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consequences from the FAA are brutal but more importantly, flying impaired comes at the risk of other people's lives. It's possible, that if the pilot of the other aircraft wasn't impaired, two lives could have been spared that fateful October day.

Discussion Questions:

- What were the flight characteristics of this accident that contributed to the mid-air?
- What does AFI 34-152 say about pattern entry and procedures?
- What does the FAA say about "see and avoid" procedures? Ref: FAR 91.113(b)
- Watch "[Collision Avoidance: See, Sense, Separate](#)" and discuss various "see and avoid" strategies.

**CONTINUE TO FLY SAFE!**



# National Transportation Safety Board

## Aviation Accident Final Report

Location:	Yerington, NV	Accident Number:	WPR15FA010A
Date & Time:	10/12/2014, 0812 PDT	Registration:	N3558C
Aircraft:	CESSNA 170B	Aircraft Damage:	Destroyed
Defining Event:	Midair collision	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

### Analysis

A Cessna 170B and a Pettit Savannah collided in midair shortly after both took off from the same airstrip. The airplanes were the second and third airplanes in a group of three airplanes whose pilots planned to depart from a fly-in at the airstrip, form up together in the traffic pattern, and then depart the area. The first airplane took off and turned left 180 degrees onto the downwind leg of the traffic pattern, and it was followed by the Cessna. Subsequently, the Savannah took off on a heading about 45 degrees to the left of the airstrip's heading and entered a climbing left turn. Witnesses reported that when the airplanes collided, the Cessna was flying level on a westerly heading on the downwind leg, and the Savannah was on about a north heading in a climbing left turn. The witnesses observed the airplanes collide at nearly a perpendicular angle.

Postaccident examination of the airplanes' wreckage revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation of either airplane. A collision angle calculated from paint transfer and scratches on the Savannah's right wing indicated that the airplanes collided at an angle of about 90 degrees, consistent with the witness reports.

The evidence indicated that the Savannah pilot attempted a join-up maneuver without maintaining adequate awareness of the Cessna's position. Before the collision occurred, the Savannah was in a climbing left turn and likely could not see the Cessna. The Savannah's pilot should have executed a clearing procedure during climb out to verify the position of the Cessna before attempting the join up. Also, had the Cessna's pilot executed a clearing procedure while on downwind, he might have been able to observe the Savannah as it was departing.

The Savannah pilot's toxicology testing identified diphenhydramine, tramadol, mefloquine, and trazodone in the muscle and liver. Additionally, tetrahydrocannabinol (THC) and its inactive metabolite tetrahydrocannabinol carboxylic acid were detected in the lung, liver, and brain. The investigation was unable to determine why the pilot was using mefloquine or if he had any adverse effects from the medication. The combined effects of diphenhydramine,

tramadol, trazodone, and THC, all of which cause sedation, likely impaired the Savannah pilot's decision-making.

## Probable Cause and Findings

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

The failure of the Savannah pilot to maintain awareness of the position of the Cessna while attempting a join up maneuver. Contributing to the accident was the impaired decision-making of the Savannah's pilot due to the combined effects of licit and illicit medications. Also contributing to the accident was the failure of the Cessna pilot to maintain awareness of the position of the Savannah as it was departing.

## Findings

Personnel issues	Monitoring other aircraft - Pilot of other aircraft (Cause) Illicit drug - Pilot of other aircraft (Factor) Prescription medication - Pilot of other aircraft (Factor) Monitoring other aircraft - Pilot (Factor)
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## Factual Information

### History of Flight

Enroute-cruise

Midair collision (Defining event)

On October 12, 2014 about 0812 Pacific daylight time, a Cessna 170B, N3558C, and an experimental amateur built Pettit Savannah, N991TP, collided in midair about 12 miles north of Yerington, Nevada. The commercial pilot, sole occupant of the Cessna, and the private pilot, sole occupant of the Savannah, were fatally injured. Both the Cessna and Savannah impacted terrain and were destroyed. Both airplanes were registered to and operated by the pilot as a Title 14 CFR Part 91 personal flight. Visual meteorological conditions prevailed, and no flight plan was filed for either flight. The Cessna departed from a nearby dry lake bed about 0809 and the Savannah about 0811. Both airplanes had a planned destination of Carson City, Nevada.

Witnesses, who were participating in a fly in, located at the dry lake bed, reported that they observed the experimental Savannah take off about 45 degrees to the left of the outlined airstrip runway heading and then turn immediately left towards the Cessna and another airplane on the downwind leg. The Cessna was heading west while flying on downwind and the Savannah was climbing out to the north and turning left while attempting to join up with the Cessna. The witnesses observed the airplanes impact at nearly a perpendicular angle to each other.

According to the pilot in the first airplane that just departed the airstrip, the Cessna and Savannah airplane were to join up with his airplane and then depart the local area, flying as three airplanes together in a loose formation. His airplane was the lead airplane on downwind and the Cessna was the second airplane established on downwind. The Savannah was the third and last airplane in the group, and planned to join with the other two airplanes on the traffic pattern downwind.

## Pilot Information

Certificate:	Commercial	Age:	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Single-engine	Toxicology Performed:	Yes
Medical Certification:	Class 2 None	Last FAA Medical Exam:	06/06/2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 2500 hours (Total, all aircraft)		

The pilot, age 48, held a commercial pilot certificate with an airplane multi engine land, single-engine land, single engine sea, and instrument ratings. He was also a Certified Flight Instructor in airplane single engine and a ground instructor. The most recent medical was a third-class airman medical certificate on June 06, 2014, with no limitations stated. The pilot reported on his most recent medical certificate application; that he had accumulated 2,500 total flight hours and 300 hours in the last six months.

## Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N3558C
Model/Series:	170B UNDESIGNAT	Aircraft Category:	Airplane
Year of Manufacture:	1954	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	26602
Landing Gear Type:	Tailwheel	Seats:	4
Date/Type of Last Inspection:	11/29/2013, 100 Hour	Certified Max Gross Wt.:	1451 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	12022.9 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	O-360A1A
Registered Owner:	On file	Rated Power:	hp
Operator:	On file	Operating Certificate(s) Held:	None

The four-seat, high-wing, fixed-gear airplane, serial number 26602, was manufactured in 1954. It was powered by a Lycoming O-360A1A, 180-hp engine. Review of the maintenance logbook records showed that the most recent inspection was an annual inspection completed on

November 29, 2013, at a total airframe time of 12,022.9 hours. The most recent engine inspection was an annual inspection on November 29, 2013, at a total operating time of 2,754.8 hours.

### Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	CXP, 4705 ft msl	Distance from Accident Site:	27 Nautical Miles
Observation Time:	0755 PDT	Direction from Accident Site:	90°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	7°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Yerington, NV (N/A)	Type of Flight Plan Filed:	None
Destination:	CARSON CITY, NV (CXP)	Type of Clearance:	None
Departure Time:	0809 PDT	Type of Airspace:	Class G

The 0755 Carson Airport (CXP), Carson City, Nevada, recorded data from the automated weather observation station, located about 27 miles east of the accident site, revealed conditions were wind calm, visibility 10 statute miles, clear sky, temperature 7 degrees Celsius, dew point 2 degrees Celsius, and an altimeter setting of 29.97 inches of mercury.

### Airport Information

Airport:	Dirt Airstrip (N/A)	Runway Surface Type:	N/A
Airport Elevation:	4706 ft	Runway Surface Condition:	Unknown
Runway Used:	N/A	IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

The make-shift, temporary, airstrip was located on a dry lake bed with a reported field elevation of about 4,706 feet. The airstrip was equipped with an outlined dirt runway; runway 090/270 (about 1,400 feet long). An information bulletin on the airstrip, provided by the fly-in sponsor, listed the eastern runway as the primary landing direction and the traffic pattern

called for left turns for both runways.

## WRECKAGE & IMPACT INFORMATION

Examination of the accident site by the National Transportation Safety Board investigator-in-charge revealed the Cessna wreckage came to rest about 1,700 feet North of the dry lake bed where the dirt strip used for takeoff was located. Two wreckage locations were identified and all major structural components of both airplanes were located within the wreckage debris area. A post-crash fire ensued at the Cessna wreckage site. The accident site was located on hilly desert terrain.

The Cessna's wings, fuselage were located within the wreckage site and were thermally damaged. The Savannah's vertical stabilizer and fuselage parts were located embedded in the Cessna wreckage. The first identified point of contact (FIPC) with the ground was about 20 feet upslope from the wreckage. The debris path was about 580 feet in length and about 460 feet in width. The direction of the wreckage debris path was oriented on a heading of about 60 degrees magnetic from the FIPC. Various small pieces of the airplane were located throughout the debris area, including paint chips.

Flight control cable continuity was confirmed on the Cessna. The left wing of the Cessna exhibited a flattened portion on its leading edge, inboard of the landing lights. Both airplane beacons were located near the Cessna wreckage. The Cessna's engine was thermally damaged but no other anomalies were noted. One propeller blade tip was observed to be bent and the other blade was bent back about 180 degrees, about mid-span.

The examination of the airplane at the accident site revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

## MEDICAL & PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on October 14, 2014, by the Washoe County Medical Examiner's Office, Reno, Nevada. The stated cause of death was multiple blunt force injuries. The FAA Forensic Toxicology Research Team, Civil Aerospace Medical Institute (CAMI), Oklahoma City, Oklahoma, performed forensic toxicology on the specimens from the pilot with negative results for carbon monoxide, cyanide, ethanol, and the listed drugs.

### Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	39.154722, -119.298056 (est)

## **Communications**

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The accident airplanes were not in contact with Air Traffic Control and the remote, mountainous area where the dry lake bed was located provided no radar coverage.

## **Additional Information**

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Several personal electronic devices were sent to the NTSB Vehicle Recorders Division for potential data download. Some of devices had recoverable data. However, of the devices that had data, no information pertinent to the investigation was present.

Federal Aviation Administration (FAA) regulations [14 CFR 91.113(b)] required that each person operating an aircraft maintain vigilance so as to "see and avoid other aircraft." When aircraft of the same certification category are converging, "the aircraft to the other's right has the right-of-way." However, the FAA Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B) noted that even if entitled to the right-of-way, a pilot should yield if another aircraft seemed too close. The handbook also stated that high-wing and low-wing aircraft have their respective blind spots. The pilot of a high-wing aircraft should momentarily raise the wing in the direction of the intended turn and look for traffic prior to commencing the turn. The handbook further states that in order to assist with collision avoidance, pilots should execute clearing procedures periodically during sustained periods of straight-and-level flight. During climbs and descents, pilots should execute gentle banks left and right to permit visual scanning of the airspace. Vigilance should also be maintained during training operations and clearing turns should be made prior to a practice maneuver being performed.

The manufacturer provided information related to the field of view from the high-wing, Cessna airplane. An individual seated in the left pilot's seat, has a view from approximately 51 degrees up and 10 degrees down out the front windshield. When looking out the left side window, the view is approximately from level to 66 degrees down. When looking out the cabin on the opposite side window, the field of view is restricted to 0 degrees up and about 26 degrees down. Additionally, the aft view is about 28 degrees to the right and 63 degrees to the left.

A rejoin is used to expedite forming up together with another airplane and is frequently used in military formation flying. The maneuver is complex, since closure rate, airspeed, altitude, and alignment with the airplane that one is forming up to must be continuously monitored.

According to Air Force's Primary Flying Manual for their T-6 primary trainer airplane, the following factors contribute significantly to the potential for a midair collision: Failure of the lead airplane to properly clear or visually monitor the number 2 airplane during a critical phase of flight, such as a rejoin. Failure of the number 2 airplane to recognize excessive overtake and the failure of the number 2 airplane to maintain lateral or vertical separation during rejoins.

Further examination of the airframe and engine was accomplished by the NTSB investigator-in-charge (IIC), an additional NTSB investigator, and an investigator from Textron Aviation. The flattened portion of the Cessna's wing leading edge corresponded to the width and shape of the damaged portion of the Savannah's vertical stabilizer and rudder.

A collision angle was calculated utilizing the paint transfer and scratches on the Savannah's right wing. The two airplanes collided about on a 90 degrees converging angle.

The examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

## Administrative Information

Investigator In Charge (IIC):	Albert P Nixon	Report Date:	11/02/2016
Additional Participating Persons:	Mark Hinzman; Federal Aviation Administration; Reno, NV Henry Solerlund; Textron Aviation; Wichita, KS		
Publish Date:	11/02/2016		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	<a href="http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=90242">http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=90242</a>		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).