Aviation Investigation Final Report

Location:	Tullahoma, Tennessee	**Accident Number:**	ERA15LA210
Date & Time:	May 13, 2015, 19:30 Local	**Registration:**	N110PS
Aircraft:	AVIAT INC PITTS S-2B	**Aircraft Damage:**	Minor
Defining Event:	Ground collision	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A red V Star biplane and a white Aviat Pitts biplane collided while both airplanes were landing on the same runway. Review of both pilot statements, a witness statement, and a video from a recorder attached to the white biplane pilot's helmet revealed that the red biplane was ahead of the white biplane in the left airport traffic pattern. Both pilots reported their positions on the common traffic advisory frequency; the white biplane pilot reported when he entered the downwind and final legs, and the red biplane pilot reported when he was 7 miles inbound and when he entered the downwind leg.

A review of the video showed that, for a 7-second period just before and as the white biplane was turning onto the base leg, the red biplane was visible as a small, dull, white flashing dot above trees on a flightpath consistent with entering the final leg. The red biplane then disappeared behind the white biplane's upper wing but then reappeared for 4 more seconds while the white biplane was on the left base leg. The red biplane then moved from left of the white biplane's nose and just below the upper wing to centered just above the nose. The red biplane then disappeared below the white biplane's cowling until 1 second before impact. The white biplane was faster than the red biplane, flew a closer traffic pattern, and turned onto the base leg sooner, which resulted in the white biplane overtaking the red biplane and landing on top of it as the red biplane touched down on the runway.

Probable Cause and Findings

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

The pilot's inadequate visual lookout, which resulted in his airplane landing on top of the other airplane.

Findings

Personnel issues	Monitoring other aircraft - Pilot

Factual Information

History of Flight

Landing-flare/touchdown	Ground collision (Defining event)

On May 13, 2015, about 1930 central daylight time, an Aviat Pitts S-2B, N110PS, and an experimental amateur-built V STAR, N675GM, collided while landing on runway 36 at Tullahoma Regional Airport (THA), Tullahoma, Tennessee. The Pitts sustained minor damage and the V STAR was substantially damaged. The private pilot of the Pitts was not injured and the private pilot of the V STAR was seriously injured. Visual meteorological conditions prevailed and no flight plans were filed for the local flights. The personal flights were conducted under the provisions of 14 Code of Federal Regulations Part 91.

The pilot of the Pitts stated that he was about 2.5 miles southeast of runway 36, at 2,500 feet mean sea level, when he switched his radio frequency from the THA automated weather observation system to the common traffic advisory frequency (CTAF). While setting up for a 45-degree entry into the airport traffic pattern, the pilot of the Pitts heard a radio transmission from another airport and then announced his position on the entry to the airport traffic pattern. While on a downwind leg of the airport traffic pattern, the pilot of the Pitts subsequently heard another radio transmission that another airplane was approaching THA and would be following the Pitts. He then heard a faint radio transmission that there was a red biplane on the runway, but no airport was associated with the transmission. He looked for a red biplane and did not see any airplanes on runway 36. The pilot of the Pitts continued his approach and again did not see any airplanes while on final approach. After crossing the runway threshold, the pilot of the Pitts heard a "bang" and felt a sudden deceleration. He did not know what happened until the airplane came to a stop, at which time he realized he had collided with another airplane. The pilot of the Pitts had a GoPro HERO 3 video recorder attached to his helmet. A copy of the accident video was forwarded to the NTSB Vehicle Recorder Laboratory, Washington, D.C., for further examination.

The pilot of the V STAR reported that he entered the downwind leg of the airport traffic pattern for runway 36 and announced his position on the CTAF using the callsign "red biplane." As the V STAR then turned from base to final leg, the pilot announced his position on the final leg of the airport traffic pattern. The V Star touched down normally and was then impacted by the Pitts.

A witness, who was a flight instructor in a third airplane, reported that at the time of the collision he was flying in the traffic pattern with a student. The witness further stated that between utilizing only a handheld radio and the distraction of teaching a student, he couldn't hear radio transmissions very well. He did recall that the Pitts pilot made an announcement that he was 7 miles out and would be entering the traffic pattern on a 45-degree entry to the downwind leg for runway 36. The witness added that the V STAR pilot had been doing touch-and-go landings on runway 36 and remaining in the traffic pattern. Although the V STAR flew a downwind, base, and final leg for runway 36, the witness only heard the V STAR pilot announce via radio that he was a half-mile final for runway 36. However, it was possible that both pilots made more radio transmissions and he did not hear them. The witness added that he extended his crosswind leg to allow the Pitts to go ahead of him as he knew the Pitts was faster than his

airplane. The Pitts was also faster than the V STAR and turned a base leg sooner than the V STAR, which resulted in the Pitts overtaking the V STAR upon landing.

Review of the video revealed that it was 7 minutes, 58 seconds long. About 3 minutes, 30 seconds elapsed time (ET), the Pitts pilot began a right turn and intercepted a path consistent with a 45-degree entry to the left downwind leg of the airport traffic pattern for runway 36. About 4 minutes, 14 seconds ET, the Pitts completed a right turn and was on the left downwind leg for runway 36. About 4 minutes, 23 seconds ET, the V Star was visible on a flight path consistent with a final leg to runway 36. The V Star appeared as a small dull white flashing dot in the vicinity of a tree line intersecting a field from the Pitts pilot's perspective. During this time, the point of view of the camera was oscillating, consistent with the Pitts pilot looking in different directions.

About 4 minutes, 29 seconds ET, which was 2 seconds after the Pitts was abeam the runway 36 numbers, the Pitts began a descending left turn. At this point, the V Star appeared as a small dot above the trees. The V Star disappeared behind the Pitts' upper wing, but then reappeared at 4 minutes, 35 seconds ET, left of the nose and just below the upper wing of the Pitts. At 4 minutes, 38 seconds, the V Star was centered just above the nose of the Pitts, which was the last moment, until impact, that the V Star was visible on the recording. At 5 minutes, 3 seconds ET, the red and white upper wing of the V Star was visible just below and to the left of the nose of the Pitts, which was 1 second before impact (for more information, see Onboard Image Recorder Specialist's Factual Report in the NTSB public docket).

The weather at THA, at 1935, included calm wind, clear sky, and visibility 10 miles.

Pilot Information

Certificate:	Private	**Age:**	62
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Rear
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	June 24, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	January 12, 2014
Flight Time:	917 hours (Total, all aircraft), 757 hours (Total, this make and model), 100 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AVIAT INC	**Registration:**	N110PS
Model/Series:	PITTS S-2B	**Aircraft Category:**	Airplane
Year of Manufacture:	1996	**Amateur Built:**	
Airworthiness Certificate:	Aerobatic	**Serial Number:**	5335
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	January 1, 2015 Annual	**Certified Max Gross Wt.:**	1625 lbs
Time Since Last Inspection:	18 Hrs	**Engines:**	Reciprocating
Airframe Total Time:	1089 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, not activated	**Engine Model/Series:**	AEIO-540
Registered Owner:	HARTVIGSEN THOMAS E	**Rated Power:**	260 Horsepower
Operator:	HARTVIGSEN THOMAS E	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	THA,1084 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:35 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.23 inches Hg	**Temperature/Dew Point:**	21°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tullahoma, TN (THA)	**Type of Flight Plan Filed:**	None
Destination:	Tullahoma, TN (THA)	**Type of Clearance:**	None
Departure Time:	18:26 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Tullahoma Regional Airport THA	**Runway Surface Type:**	Asphalt
Airport Elevation:	1084 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	36	**IFR Approach:**	None
Runway Length/Width:	5002 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Minor
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	35.374721,-86.241111(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Rocky Davidson; FAA/FSDO; Nashville, TN
Original Publish Date:	November 19, 2015
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=91165

Aviation Investigation Final Report

Location:	Tullahoma, Tennessee	**Accident Number:**	ERA15LA210
Date & Time:	May 13, 2015, 19:30 Local	**Registration:**	N675GM
Aircraft:	MEUER GARY D V STAR	**Aircraft Damage:**	Substantial
Defining Event:	Ground collision	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A red V Star biplane and a white Aviat Pitts biplane collided while both airplanes were landing on the same runway. Review of both pilot statements, a witness statement, and a video from a recorder attached to the white biplane pilot's helmet revealed that the red biplane was ahead of the white biplane in the left airport traffic pattern. Both pilots reported their positions on the common traffic advisory frequency; the white biplane pilot reported when he entered the downwind and final legs, and the red biplane pilot reported when he was 7 miles inbound and when he entered the downwind leg.

A review of the video showed that, for a 7-second period just before and as the white biplane was turning onto the base leg, the red biplane was visible as a small, dull, white flashing dot above trees on a flightpath consistent with entering the final leg. The red biplane then disappeared behind the white biplane's upper wing but then reappeared for 4 more seconds while the white biplane was on the left base leg. The red biplane then moved from left of the white biplane's nose and just below the upper wing to centered just above the nose. The red biplane then disappeared below the white biplane's cowling until 1 second before impact. The white biplane was faster than the red biplane, flew a closer traffic pattern, and turned onto the base leg sooner, which resulted in the white biplane overtaking the red biplane and landing on top of it as the red biplane touched down on the runway.

Probable Cause and Findings

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

The other pilot's inadequate visual lookout, which resulted in his airplane landing on top of this airplane.

Findings

Personnel issues	Monitoring other aircraft - Pilot of other aircraft

Factual Information

History of Flight

Landing-flare/touchdown	Ground collision

On May 13, 2015, about 1930 central daylight time, an Aviat Pitts S-2B, N110PS, and an experimental amateur-built V STAR, N675GM, collided while landing on runway 36 at Tullahoma Regional Airport (THA), Tullahoma, Tennessee. The Pitts sustained minor damage and the V STAR was substantially damaged. The private pilot of the Pitts was not injured and the private pilot of the V STAR was seriously injured. Visual meteorological conditions prevailed and no flight plans were filed for the local flights. The personal flights were conducted under the provisions of 14 Code of Federal Regulations Part 91.

The pilot of the Pitts stated that he was about 2.5 miles southeast of runway 36, at 2,500 feet mean sea level, when he switched his radio frequency from the THA automated weather observation system to the common traffic advisory frequency (CTAF). While setting up for a 45-degree entry into the airport traffic pattern, the pilot of the Pitts heard a radio transmission from another airport and then announced his position on the entry to the airport traffic pattern. While on a downwind leg of the airport traffic pattern, the pilot of the Pitts subsequently heard another radio transmission that another airplane was approaching THA and would be following the Pitts. He then heard a faint radio transmission that there was a red biplane on the runway, but no airport was associated with the transmission. He looked for a red biplane and did not see any airplanes on runway 36. The pilot of the Pitts continued his approach and again did not see any airplanes while on final approach. After crossing the runway threshold, the pilot of the Pitts heard a "bang" and felt a sudden deceleration. He did not know what happened until the airplane came to a stop, at which time he realized he had collided with another airplane. The pilot of the Pitts had a GoPro HERO 3 video recorder attached to his helmet. A copy of the accident video was forwarded to the NTSB Vehicle Recorder Laboratory, Washington, D.C., for further examination.

The pilot of the V STAR reported that he entered the downwind leg of the airport traffic pattern for runway 36 and announced his position on the CTAF using the callsign "red biplane." As the V STAR then turned from base to final leg, the pilot announced his position on the final leg of the airport traffic pattern. The V Star touched down normally and was then impacted by the Pitts.

A witness, who was a flight instructor in a third airplane, reported that at the time of the collision he was flying in the traffic pattern with a student. The witness further stated that between utilizing only a handheld radio and the distraction of teaching a student, he couldn't hear radio transmissions very well. He did recall that the Pitts pilot made an announcement that he was 7 miles out and would be entering the traffic pattern on a 45-degree entry to the downwind leg for runway 36. The witness added that the V STAR pilot had been doing touch-and-go landings on runway 36 and remaining in the traffic pattern. Although the V STAR flew a downwind, base, and final leg for runway 36, the witness only heard the V STAR pilot announce via radio that he was a half-mile final for runway 36. However, it was possible that both pilots made more radio transmissions and he did not hear them. The witness added that he extended his crosswind leg to allow the Pitts to go ahead of him as he knew the Pitts was faster than his

airplane. The Pitts was also faster than the V STAR and turned a base leg sooner than the V STAR, which resulted in the Pitts overtaking the V STAR upon landing.

Review of the video revealed that it was 7 minutes, 58 seconds long. About 3 minutes, 30 seconds elapsed time (ET), the Pitts pilot began a right turn and intercepted a path consistent with a 45-degree entry to the left downwind leg of the airport traffic pattern for runway 36. About 4 minutes, 14 seconds ET, the Pitts completed a right turn and was on the left downwind leg for runway 36. About 4 minutes, 23 seconds ET, the V Star was visible on a flight path consistent with a final leg to runway 36. The V Star appeared as a small dull white flashing dot in the vicinity of a tree line intersecting a field from the Pitts pilot's perspective. During this time, the point of view of the camera was oscillating, consistent with the Pitts pilot looking in different directions.

About 4 minutes, 29 seconds ET, which was 2 seconds after the Pitts was abeam the runway 36 numbers, the Pitts began a descending left turn. At this point, the V Star appeared as a small dot above the trees. The V Star disappeared behind the Pitts' upper wing, but then reappeared at 4 minutes, 35 seconds ET, left of the nose and just below the upper wing of the Pitts. At 4 minutes, 38 seconds, the V Star was centered just above the nose of the Pitts, which was the last moment, until impact, that the V Star was visible on the recording. At 5 minutes, 3 seconds ET, the red and white upper wing of the V Star was visible just below and to the left of the nose of the Pitts, which was 1 second before impact (for more information, see Onboard Image Recorder Specialist's Factual Report in the NTSB public docket).

The weather at THA, at 1935, included calm wind, clear sky, and visibility 10 miles.

Pilot Information

Certificate:	Private	**Age:**	63
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Sport pilot	**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 16, 2015
Flight Time:	1180 hours (Total, all aircraft), 57 hours (Total, this make and model), 1180 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	MEUER GARY D	**Registration:**	N675GM
Model/Series:	V STAR	**Aircraft Category:**	Airplane
Year of Manufacture:	2010	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	007
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	May 2, 2015 Condition	**Certified Max Gross Wt.:**	3120 lbs
Time Since Last Inspection:	9 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	51 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Not installed	**Engine Model/Series:**	O-290
Registered Owner:	MEUER GARY	**Rated Power:**	125 Horsepower
Operator:	MEUER GARY	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	THA,1084 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:35 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.23 inches Hg	**Temperature/Dew Point:**	21°C / 2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tullahoma, TN (THA)	**Type of Flight Plan Filed:**	None
Destination:	Tullahoma, TN (THA)	**Type of Clearance:**	None
Departure Time:	18:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Tullahoma Regional Airport THA	**Runway Surface Type:**	Asphalt
Airport Elevation:	1084 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	36	**IFR Approach:**	None
Runway Length/Width:	5002 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	35.374721,-86.241111(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Rocky Davidson; FAA/FSDO; Nashville, TN
Original Publish Date:	November 19, 2015
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=91165