

CIVIL AERONAUTICS BOARD

AIRCRAFT ACCIDENT REPORT

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COLLISION OF CIVIL AIR PATROL AERONCA
L-16A, N 9330H, AND CESSNA 140, N 1652V, NEAR
NORTH PHILADELPHIA AIRPORT, PHILADELPHIA,
PENNSYLVANIA, SEPTEMBER 30, 1959

SYNOPSIS

At approximately 1430 e.s.t., September 30, 1959, a Cessna 140, N 1652V, owned and flown by Mr. Richard G. Hochrein, while on final approach to runway 15 at the North Philadelphia Airport collided with an Aeronca L-16A, N 9330H, owned and operated by Philadelphia Group No. 10, 31st Pennsylvania Wing of the Civil Air Patrol piloted by Mr. Robert T. Wilson. The Cessna crashed to the ground, killing the pilot. The pilot of the Aeronca was able to regain control of his damaged aircraft and effect a successful landing.

The Board has determined that this accident was caused by the failure of the FAA tower personnel to issue timely air traffic control advisories to Cessna N 1652V which would have alerted the pilot to a possible traffic conflict, and the failure of the two pilots to maintain proper vigilance to avoid collision while flying a traffic pattern in preparation for landing.

Investigation

At approximately 1355,^{1/} Mr. Robert T. Wilson, a pilot with the Pennsylvania Wing of the Civil Air Patrol, departed North Philadelphia Airport piloting a silver-painted CAP Aeronca, N 9330H, for a local solo training flight. The Aeronca did not have a radio and, according to Mr. Wilson, received a green light from the tower for takeoff. After takeoff, the aircraft departed the field area for approximately 10 to 15 minutes. It then returned to the North Philadelphia Airport and began making touch-and-go landings utilizing runway 15. Mr. Wilson held a valid private pilot certificate and had a total of 600 flying hours.

At approximately 1400, a Cessna 140, N 1652V, painted green trim on cream, owned and piloted by Mr. Richard G. Hochrein of Portland, Pennsylvania, departed Lake Susquehanna Airport, Blairstown, New Jersey, for the North Philadelphia Airport. At approximately 1420, the North Philadelphia Airport tower received a radio call from N 1652V requesting landing instructions. The tower cleared the aircraft to enter the landing pattern and to land on runway 15. No traffic information was given to the pilot at this time. Mr. Hochrein held a

^{1/} All times herein are eastern standard based on the 24-hour clock.

valid private pilot certificate and had accumulated a total of 122 flying hours.

The field elevation of North Philadelphia Airport is 120 feet; the recommended traffic is left, to be flown at an altitude of 1,000 feet above the ground.

The pilot of the Aeronca said that after returning to the airport he was on his third or fourth touch-and-go approach to runway 15 and had not received any light signals from the tower since receiving a green light for the original takeoff. Several aeronautically experienced groundwitnesses, who were seated on a bench directly in front of the tower at the time, observed the aircraft making touch-and-go landings. According to these witnesses, both aircraft were observed to be in close proximity to one another while they were on their downwind, base, and final approach. These witnesses place the Aeronca inside of, ahead of, and at approximately the same altitude as the Cessna when observed on the downwind leg.

After clearing the Cessna via radio for landing on runway 15, the tower operator located the aircraft visually on the downwind leg. He also observed another aircraft which he identified as the Aeronca, which, he states, was outside of, above, and behind the Cessna. He did not observe the Aeronca practicing touch-and-go landings prior to this time.

The following testimony was given by the two tower operators on duty: An alternate green and red warning light^{2/} was given to what they believed to be the Aeronca while it was on the downwind leg and while the aircraft was turning onto the base leg. No instructions or advisories were issued via radio to the Cessna pilot as he traversed the downwind and base leg. The light was changed to steady red^{3/} which was directed toward the Aeronca until the aircraft collided. No subsequent radio contacts were made with the Cessna pilot, following the initial issuance of landing instructions, until just prior to the collision when the Cessna pilot was told, "Do not land." An exchange of conflicting traffic or reason for cancellation of the original landing clearance was not given to the pilot of the Cessna. The Cessna then acknowledged the message, leveled off, and continued straight ahead.

According to the Aeronca pilot, no lights from the tower were observed by him at any time during this approach, nor during any of his previous approaches and touch-and-go landings. The only light signals transmitted by the tower during his previous touch-and-go landings was the green light for the original take-off clearance.

The midair collision occurred approximately 500 feet from the approach end of the runway 15 while both aircraft were lined up on their final approach. The Cessna was directly below and a little to the right of the Aeronca. The Aeronca

^{2/} According to Section 3.221 of the ANC Manual, this light signal used for the control of air traffic means "General warning signal - exercise extreme caution."

^{3/} This light signal means "Give way to other aircraft and continue circling."

continued to descend after the Cessna leveled off and initial impact occurred between the forward left wingtip of the Cessna and the underside of the Aeronca right aft lift strut midway at the strut brace position. The Cessna proceeded under the Aeronca's wing and the leading edge of the Cessna's vertical stabilizer contacted the Aeronca's right aileron, bending the Cessna's stabilizer and rudder 90 degrees to the right to a flat position. Both aircraft momentarily locked together and entered a bank to the left. The Aeronca managed to turn inside the Cessna and pull up. According to the pilot of the Aeronca, the Cessna then pulled up and struck the Aeronca a second time, this time in the area of the right wing struts. A dent was also made in the underside of the leading edge of the right wing. The Cessna pilot lost control of his aircraft and it plunged to the ground. Collision impact caused binding of the Aeronca's right aileron and subsequent partial loss of control. However, the pilot succeeded in landing on runway 15 with no further damage. Ground impact of the Cessna occurred 75 feet from the approach end of runway 15 and 375 feet to the left of the runway 15 centerline.

Weather at the time was scattered clouds at 4,000 feet, high broken clouds; visibility 15 miles; temperature 83°F; surface winds from the south-southeast at 13 knots.

A witness driving an auto stopped on a boulevard approximately 2,500 feet from the end of runway 15 and observed the aircraft pass over his position just prior to the impact. He stated that at this point the Cessna was directly below and to the right of the Aeronca with a vertical separation of approximately 200 feet. All witnesses, including the North Philadelphia Airport tower personnel, agree on that relative position of the two aircraft just prior to impact.

The damage sustained by the Aeronca L-16A was confined to the right wing, the right aileron, and the right lift struts. The right aileron had been stuck at the trailing edge by the vertical fin of the Cessna. This buckled the diagonal ribs nearest the trailing edge of the aileron, scuffed but did not tear the aileron fabric, and loosened and damaged the internal wing structure forward of the right aileron. No evidence of inflight contact was found on the tail surfaces, fuselage, or landing gear of the Aeronca.

The inflight damage to the Cessna was confined to minor damage to the left wing near the tip, and severe damage to the aft fuselage and tail. The left wingtip damage consisted of a tear in the upper fabric and deformation of the internal rib structure. The shape of this damage matched closely with the shape of the aft jury strut bracket attach bolt and nut from the right wing of the Aeronca. The vertical stabilizer was broken at its base and bent approximately 90 degrees to the right and was generally wrinkled; a leading edge dent appeared 18 inches below the tip. The major portion of the left side of the fin had scratches running up and slightly aft. No evidence of inflight contact between the two aircraft was found on any other part of the Cessna.

The North Philadelphia Airport Control Tower is an FAA tower which operates on a 24-hour basis. It is staffed by a chief controller and three air traffic control specialists, all of whom had control tower operator certificates with senior ratings. No scheduled air carriers land or take off from North Philadelphia Airport, and traffic consists mostly of light single and twin-engine transient or locally based aircraft. The tower makes no recordings of radio transmissions or receptions.

The tower was equipped with a portable traffic light (Aldis lamp) which is directional and emits an intense, narrow beam of light. The color of the light (white, green, or red) is controlled by the operator through a system of levers and triggers in the two handles. Signals may be discernible to the pilot of any aircraft visible to the tower operators and to which the light is directed.

A small extension from the lamp glows when the light is actuated by a trigger, indicating that the light is operating. The tower controller could not remember whether he saw this indication when he directed the light toward the Aeronca. However, he stated the light did function correctly when checked immediately following the accident.

The disadvantages of the use of the light are that the pilot cannot constantly look at the control tower while flying his airplane and could inadvertently miss a signal directed toward him; the information transmitted by the light signal is limited; and no accurate sighting device is provided.

There was conflicting testimony between the North Philadelphia Control Tower operators and pilots who fly nonradio aircraft as to whether preventive control was in effect at the airport.^{4/} "Preventive Control" applies at locations which have locally based squadrons or groups of military aircraft, or local civilian operators, or schools such as North Philadelphia Airport. In such cases mutual agreements and arrangements must be made with the responsible heads of these groups prior to the inauguration of preventive control. Such control is not to be employed for transient aircraft.

No evidence could be found to indicate that an agreement or prearrangement had been made in accordance with Section 3.700 of the ANC Manual between the North Philadelphia Airport Control Tower and the Civil Air Patrol, or between the tower and the civilian flying school based at the airport, as related to the use of negative or "preventive control." Nevertheless, several witnesses, including the FAA Supervising Inspector of the Philadelphia General Safety District Office, stated it was the practice at North Philadelphia Airport for nonradio-equipped aircraft to continue an approach and land without light communications. In the absence of radio communications or any light signal, any aircraft may land or take off at any airport without prior approval.

Analysis

Although it is recognized that there was conflicting evidence as to the positions of the aircraft in the traffic pattern, the Board believes that the actual positions of the aircraft were as follows: The Cessna entered the landing pattern behind, to the right of, and below the Aeronca. The Aeronca pilot could not have seen the Cessna without looking back to his right and down. This is quite unlikely since his attention would have most likely been directed to the airport and runway which was to his left as he flew the downwind and base leg.

^{4/} The ANC Manual states: "Preventive Control is defined as a system of control whereby useful preventive advice is given to pilots of aircraft in the air and a routine approval of the pilot's anticipated actions is eliminated. . . The pilot is expected to continue flight including landing in a normal manner unless otherwise advised by the airport traffic controller."

Considering the relative speeds of the two aircraft, with the Cessna being somewhat faster, the Board believes the two aircraft could maintain this position throughout the traffic pattern until turning onto the final approach. The fact that the Aeronca was on the inside during the turns onto the base and final approach, and therefore traveling the shorter distance, was compensated for by the relatively faster speed of the Cessna. The two 90-degree turns that each made, served to close the gap between the two aircraft and placed the Cessna under the Aeronca on final approach just prior to collision.

The Aeronca pilot stated that because the air was rougher than usual, he was flying at a slightly higher airspeed which tended to give his aircraft better landing characteristics. When both aircraft were on final approach the tower operator instructed the Cessna pilot by radio not to land. The Cessna pilot acknowledged these instructions and was observed to level off. It was at this point that the collision occurred. Since the Cessna pilot was not told why he was not to land, it can logically be assumed that having received this instruction he leveled the nose of his aircraft and applied power for an aborted landing. The Cessna pilot, having altered his glide angle to level flight and increased his airspeed, overtook and collided with the Aeronca which was descending. The damage to the aileron of the Aeronca and the rudder of the Cessna attests to the fact that the Cessna was moving faster than the Aeronca at the moment of collision.

The tower operator stated an alternating green and red warning light was given the Aeronca pilot while the aircraft was on the downwind leg and while turning on the base leg, and a steady red light was directed toward the Aeronca until the aircraft collided. Whether or not a warning light or a signal to give way or whether such signals were directed to the right aircraft is questionable. The portable traffic lamp was checked immediately after the accident and determined to be in proper working order. It is possible that a warning light was given while both aircraft were on the downwind leg. With both pilots at this time concentrating on the landing end of the runway and with the tower positioned off to the rear of each pilot's left shoulder, it is reasonable to assume that a light given while the aircraft were in this position could have been missed by both pilots. When both aircraft turned onto base leg, their positions would have enabled their pilots to see the warning light if given, which, according to the tower controller, was meant for the pilot of the Aeronca which he believed was the second aircraft.

When the two aircraft turned onto final approach, the possibility of either pilot seeing a light signal from the tower is greatly increased. Yet neither pilot took action indicative of his having seen a light signal. It is reasonable to assume that had the Cessna pilot seen a red warning light shining in his direction he would have used his radio to inquire whether it was meant for him. Had the Aeronca pilot seen the light he would have discontinued his approach and circled to the left.

It is entirely possible that the reason for neither pilot seeing a light was because the tower operator directed the light to the second aircraft, which was the Cessna 140, while mistakenly thinking it was the Aeronca L-16. Since the Cessna pilot was receiving his instructions by radio, it is unlikely that he would be observant of a light signal from the tower.

Part 60 of the Civil Air Regulations clearly states the responsibility of pilots to observe and avoid other aircraft.^{5/} Had the Cessna pilot observed the Aeronca L-16 he no doubt would have asked the tower whether there was other traffic in the landing pattern. Had the Aeronca L-16 pilot seen the Cessna 140 he no doubt would have been particularly observant for a light from the tower and would probably have circled to put himself at a farther distance from the Cessna 140. It is evident that had either pilot observed the other aircraft while in the traffic pattern he would have taken some action to ascertain whether the other aircraft was also in the pattern. It is further evident that each pilot continued his landing approach unaware of the presence of the other and without accurate visual or timely verbal warning from the tower until too late to avoid a collision.

Under Part 60 of the Civil Air Regulations, a pilot would be expected to clear his position in preparation for landing, and clear himself in each turn, should he make turns to the base leg and final approach. In the absence of a sequence and on the basis of the clearance received, it was not imprudent of the Cessna pilot to assume that the area was clear of conflicting traffic. Nevertheless, the pilot of the Cessna 140 should have observed the Aeronca L-16 as he entered the downwind leg if he had properly cleared his position as he entered. He should also have observed the Aeronca L-16 as he turned left to the base and final approaches since the Aeronca was inside of him and slightly above his altitude. The entry of the downwind leg at a 45-degree angle for an approach to landing is for the purpose of determining whether other traffic is in the landing pattern and to ensure an orderly entry to traffic, proper spacing for prevention of a collision, and to prevent aircraft from overtaking other aircraft in the traffic pattern.

5/ "60.12 Careless or reckless operation. No person shall operate aircraft in a careless or reckless manner so as to endanger the life or property of others... (c) Lack of vigilance by the pilot to observe and avoid other air traffic. This includes failure of the pilot to clear his position prior to starting any maneuver, either on the ground or in flight..."

"60.14 (d) Overtaking. An aircraft that is being overtaken has the right-of-way, and the overtaking aircraft, whether climbing, descending, or in horizontal flight, shall keep out of the way of the other aircraft by altering its course to the right, and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear..."

"60.14 (e) Landing. Aircraft, while on final approach to land, or while landing, have the right-of-way over other aircraft in flight or operating on the surface. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in in front of another which is on final approach to land, or to overtake that aircraft..."

"60.15 Proximity of aircraft. No person shall operate an aircraft in such proximity to other aircraft as to create a collision hazard..."

Part 26 of the Civil Air Regulations prescribed certain procedures and practices which certificated air traffic control tower operators should follow.^{6/} Part 617.21 of the Administrator's Air Navigation Regulations (14 CFR 617) provided that "an airport traffic control tower is responsible for the issuance of clearances and information to pilots of aircraft for the purpose of protecting air traffic by aiding pilots in the prevention of collision between aircraft... in the traffic pattern." Section 60.60 of the Civil Air Regulations defines air traffic control as "a service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic." The duties of the airport traffic controller, therefore, include assisting the person in command of an aircraft by providing such advice and information as may be useful for the safe and efficient conduct of the flight. The failure of the tower controllers to observe the Aeronca L-16 accomplishing touch-and-go landing on runway 15 indicates a neglect of these responsibilities and duties.

The Board believes that the air traffic controllers should have used every means at their disposal, including radio communication, to warn the radio-equipped aircraft of any dangerous situation which might cause a collision. Failure to advise the Cessna 140 pilot by radio while on the downwind and base leg after it appeared that the Aeronca L-16 was not altering course was one of the causal factors in this accident.

Conclusions

The Board concludes that the Cessna 140 pilot, after being cleared by radio, entered the traffic pattern outside of, below, and slightly behind the Aeronca L-16 which was already in the traffic pattern accomplishing touch-and-go landings. The Aeronca L-16 was hidden from the view of the Cessna 140 pilot by the left wing of the Cessna, the Cessna being below and to the right rear of the Aeronca. Each pilot continued his landing approach unaware of the presence of the other and without accurate visual or timely verbal warning from the tower until too late to avoid a collision. Visual light indications that were given were mistakenly directed to the Cessna 140 which the tower controller believed was the Aeronca L-16. The Cessna 140 pilot had the best opportunity to observe the Aeronca L-16 as he traversed his 45-degree entry to the downwind leg. He remained behind, slightly below, and to the right of the Aeronca L-16 throughout the remainder of the traffic pattern. The Cessna pilot's failure to observe the Aeronca L-16 was due to either a blind spot caused by a portion of the Cessna blocking out his view of the Aeronca, or his failure to adequately clear himself as he entered the downwind leg, and as he made his left turns to the base leg and final approach.

^{6/} "26.26 Exercise of Authority. A certificated air-traffic control-tower operator shall control traffic in accordance with the procedures and practices prescribed by the Administrator to provide for the safe, orderly and expeditious flow of air traffic..."

Section 60.60 Definitions: "Air Traffic Control. A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic."

After the Cessna 140 pilot received the warning from the tower not to land during the final approach, he leveled off, overtook the Aeronca L-16 which was descending, and collided with it.

The primary causal factor in this accident was the failure of the North Philadelphia Airport traffic controller to effect accurate visual and timely verbal air traffic advisories to aid the pilots of the aircraft flying the traffic pattern.

Probable Cause

The Board determines the probable cause of this accident was the failure of FAA tower personnel to issue accurate visual and timely verbal air traffic advisories and the failure of the pilots of the two aircraft to maintain proper vigilance to avoid collision.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ALAN S. BOYD
Chairman

/s/ ROBERT T. MURPHY
Vice Chairman

/s/ G. JOSEPH MINETTI
Member

/s/ WHITNEY GILLILLAND
Member

Chan Gurney, Member, did not take part in the adoption of this report.

S U P P L E M E N T A L D A T A

Investigation and Depositions

The Civil Aeronautics Board was notified of this accident shortly after occurrence. An investigation was conducted in accordance with the provisions of the Federal Aviation Act of 1958. Depositions were taken at the North Philadelphia Airport on November 13, 1959.

The Aircraft

The Aeronca was owned by the Pennsylvania wing of the Civil Air Patrol. The aircraft bore serial number 7BCM-249 and was known as an Air Force L-16A. It had a total of 1,432:05 flight hours as of September 30, 1959. The last periodic or 100-hour inspection was performed on June 6, 1959, at which time the total flight hours were recorded as 1,288:50. It was equipped with a Continental model C-85-PJ engine which bore serial number 30916-9-8. Records indicated that the total time on the engine as of September 30, 1959, was 752:55 hours.

The Cessna, model 140, was purchased by Mr. Hochrein on June 20, 1959, and bore manufacturer's serial number 13824. The aircraft had been relicensed July 1, 1959. Total aircraft time was recorded as 1,774 flight hours. It was equipped with a Continental, model C85-12, 85-h.p. engine which bore serial number 28088-7-12. Logbook entries indicated that the total time on the engine since a major overhaul was 734 hours.

The Pilots

Mr. Robert T. Wilson, age 38, pilot of the Aeronca L-16A, possessed a currently valid private pilot certificate, No. 382514, with airplane single-engine land rating. He had accumulated a total of 600 flight hours, had 4 hours flight time in the model involved in this accident, and approximately 25 flying hours in the last 90 days preceding the accident. He had passed a third-class medical examination on June 18, 1959.

Mr. Richard G. Hochrein, age 30, pilot of the Cessna 140, possessed a currently valid private pilot certificate, No. 1409389, with airplane single-engine land rating. He had accumulated a total of 122 flight hours, 45:10 flight hours in the model involved in this accident, and approximately 40:10 flying hours in the last 90 days preceding the accident. He had passed a third-class medical examination on May 21, 1959.

COLLISION OF CESSNA 140, N-1652 V, AND AERONCA L-16, N-9330 H NEAR NORTH PHILADELPHIA AIRPORT September 30, 1959

