SA-310 File No. 1-0111

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: January 6, 1956 Released: January 11, 1956

CONTINENTAL AIR LINES, INC., AND HINES FLYING SERVICE,
HOBBS, NEW MEXICO, AUGUST 29, 1955

The Accident

Two aircraft collided in clear weather while both were approaching to land at the Lea County Airport, Hobbs, New Mexico, August 29, 1955, about 1245.1/ One, a Continental Air Lines DC-3, N 18945, damaged but without impairment of control or injury to any occupant, was landed safely after a go-around. The other, a Hines Flying Service single-engine Piper PA-22, N 3334B, plunged nose first to the runway, seriously injuring its pilot, the sole occupant. There was no fire.

History of the Flights

Continental Air Lines' Flight 114 of August 29 originated at El Paso, Texas, for Houston, Texas. Stops were scheduled at Carlsbad and Hobbs, New Mexico, and at Midland-Odessa, San Angelo, and Austin, Texas. Departure from El Paso was on schedule at 1120, with arrival at Carlsbad on schedule and without incident at 1215. Departure for Hobbs was at 1217 on a VFR flight plan with 11 passengers and a crew of Captain John R. Thompson, First Officer Malcolm Edwards, and Stewardess Patricia McDonald. At takeoff the gross weight of 23,929 pounds and the center of gravity were within prescribed limits.

Pilot Otha Aishman, flying the Hines Flying Service Piper, departed Wichita Falls, Texas, on a VFR flight for Hobbs, New Mexico, at approximately 0950. The aircraft was properly loaded in respect to weight and center of gravity.

First Officer Edwards flew the 57-mile Carlsbad-Hobbs segment of CAL Flight 114 from the right seat with Captain Thompson on the left acting as copilot. From Carlsbad the flight proceeded uneventfully at a cruising altitude of 5,000 feet m. s. l. in excellent weather.

At 1237 Flight 114 called "in range" (approximately eight minutes out) to the company radio station at the Lea County Airport, which gave the following landing information: Altimeter 29.93, wind east-northeast 5 to 10 knots. Flight 114 acknowledged this message and, since there was no control tower at the airport, inquired if there was any local traffic. The operator stepped outdoors and looked, saw none, and advised that there was none visible from the terminal. The pilots accomplished the in-range checklist following this contact.

1/ All times herein are mountain standard based on the 24-hour clock; all distances are in nautical miles, and all speeds in knots.

Captain Thompson then advised First Officer Edwards to fly north (to the left) of the course so as to be in position for a right turn to a base leg of a left-hand traffic pattern. Accordingly, when approximately 3-1/2 miles from the airport, the first officer turned right to a heading of 120 degrees starting a base leg for runway 3 and maintained an altitude of 4,500 feet m. s. l., about 840 feet above the ground, while on the base leg. (The airport is at an elevation of 3,659 feet m. s. l.) A left turn from base to final for runway 3 was made approximately 2-1/2 miles out and about 800 feet above the ground, at which time the landing gear was lowered, one-quarter flaps were applied, and the final landing checklist was accomplished. Approximately one mile out one-half flaps were applied. At one-half mile out flaps were extended fully at an airspeed of 95 knots. Captain Thompson called the airspeed with each five knots change and the aircraft crossed the field boundary at 80 knots.

About this time the captain saw from the left side window the ground shadow of an aircraft converging with his flight path over the runway. He at once took control from the first officer, skidded the aircraft evasively to the right, used emergency power, and called for gear up. Edwards raised the gear as from the left side window Captain Thompson saw a Piper Tri-Pacer. It was close ahead, above, and nearly into his left propeller. The distance closed rapidly and almost instantly the propeller struck the tail surfaces of the Piper. The DC-3 made an emergency pullout and circled the airport, landing on runway 17 without further incident. Both the captain and the first officer testified that they had looked for other traffic but saw none until the captain's first glimpse of the Piper's shadow.

Aishman, the Piper pilot, checked the en route weather before departing Wichita Falls and found it suitable for VFR flight. He proceeded to Hobbs, New Mexico, on a southwesterly course, at an altitude of about 5,000 feet m. s. l. without incident. The distance is about 284 miles. At 1239 Aishman called the Hobbs CAA radio, gave his position as northeast of Hobbs, and requested surface wind direction and velocity, and altimeter setting. Hobbs CAA radio replied giving the requested information, adding that the wind favored runway 3 and to exercise caution because of men and equipment on the field. This contact was made while the Piper was an estimated five miles northeast of the airport at an altitude of 4,700 feet m. s. l. Aishman acknowledged the message and continued toward the airport. On nearing it, he altered his course slightly to the left in order to enter the traffic pattern on a downwind leg for runway 3. This leg was flown at an altitude of approximately 4,460 feet m. s. l., 800 feet above the ground, about one-half to three-quarters of a mile to the west-northwest of runway 3. Pilot Aishman stated that while flying the downwind leg, he looked for other traffic and saw none. He said he made a left turn, establishing a base leg about 1/4 mile long, and again checked the area for other traffic. None was seen. (During this period he lowered the flaps one notch.)

The left turn to final was steepened and at an airspeed of approximately 68 knots, full flaps, to the second notch, were applied. As he neared the approach end of runway 3, Aishman realized that he was too high and started a forward slip to lose altitude and land short on the runway. At this time his airspeed was between 45 and 55 knots. Just after passing the end of the runway, Aishman heard a loud roar. He glanced out of the right window and saw the nose of another aircraft alongside and slightly above him. At this point the two

aircraft collided and the Piper crashed to runway 3 some 560 feet from its approach end. The time of collision was approximately 1245 and the altitude was 30-40 feet.

Investigation

The official weather at the airport a few minutes after the accident was reported as: Ceiling estimated 7,000 broken, broken clouds at 25,000; visibility 15 plus; wind east-northeast 5; altimeter 29.95. The sun was plainly visible at a computed elevation above the horizon of 64 degrees; its bearing was slightly west of south. The air was moderately turbulent. The Piper was painted cream and brown; the DC-3 was natural aluminum with white and blue trim. The pilots of both aircraft testified that their respective windshields were clean.

Impact was between the left propeller of the DC-3 and the empennage of the Piper. It was possible to reconstruct partially the shattered empennage of the Piper by matching parts and pieces of ripped fabric against a similar aircraft. This study showed that the first propeller blade contact cut off the navigation light on the trailing edge of the rudder. Subsequent propeller cuts sliced through the rudder and elevators, continued forward through the fin and stabilizers, and finally tore apart the aft fuselage almost as far forward as the baggage compartment. The cuts in the rudder and left elevator were quite distinct, nearly parallel, and sufficiently uniform in spacing to allow a computation of the difference in speeds of the two aircraft. The engines of the DC-3 were at a probable speed of about 2,700 r. p. m., and the difference in the horizontal components of the two speeds was approximately 13 knots, the DC-3 traveling faster.

The angles of the propeller cuts relative to the longitudinal axis of the Piper tell the relative attitude of the two aircraft at the time of and for a very brief period immediately following first impact. The longitudinal axis of the Piper diverged about 7 degrees to the left and about 7 degrees downward from the longitudinal axis of the DC-3. The Piper was banked to its left (the DC-3 was level laterally) by an amount not readily determinable from the cuts but, as mentioned, the Piper pilot estimates the bank at 30 degrees and the DC-3 captain estimates it at 15 degrees. At the moment of first contact the left propeller hub of the DC-3 was about three feet from the bottom of the rudder and about one-half foot left of the centerline of the Piper.

Damage to the DC-3 was caused by small metallic pieces from the empennage of the Piper being thrown by the left propeller of the DC-3. Some of these pieces penetrated the fuselage and ripped clothing that was hanging just behind the pilots, but control of the aircraft was not affected. The left propeller bore deep marks of impact.

Continental Airlines' Operations Manual prescribes that at all uncontrolled airports approaching flights shall establish a base leg prior to starting final in order to observe other traffic more adequately. The DC-3 pilots testified that they conformed to this requirement as they approached the airport and flew to the left in order to establish a base leg. Their testimony was confirmed by ground witnesses.

The Piper approached the airport from a direction substantially opposite that of runway 3 and to the northwest of that runway. It was then flown on the downwind leg in a direction approximately opposite runway 3 to a point about abreast of its approach end. Consequently approximately 180 degrees of left turn was necessary to align with that runway. Testimony of competent ground witnesses indicates that this turn was continuous or nearly so, with the aircraft banked appreciably throughout the turn. It also indicates that the Piper was the higher of the two aircraft as both approached the runway, the DC-3 in straight descending flight and level laterally, the Piper in a rather sharp left turn merging into a left forward slip just before collision. These flight paths were confirmed shortly after the accident by ground observations of simulated approaches of two identical aircraft. (Refer to Attachment A.)

At 1237 the DC-3 reported to its own company radio station at the airport. At 1239 the Piper reported to the Hobbs CAA radio. The CAA radioman and the CAL operator, in separated offices in the same building, did not exchange their respective items of traffic information.

Airport authorities had published local traffic rules accompanied by the conventional left-hand traffic diagram several years earlier. These rules and diagram had met with CAA acceptance inasmuch as they had originally been submitted to the CAA and had been posted conspicuously at the airport. Pilot Aishman testified that he was familiar with these traffic rules. Captain Thompson's last route check included Lea County Airport and was on March 21, 1955. It complied with company approach procedures, which are in accord with local traffic rules.

The Lea County Airport is on flat terrain offering no significant obstruction to vision in any direction. The two aircraft involved were the only two in the air at the time and place of the accident.

Analysis

Regardless of the numerous devices and measures such as traffic rules and diagrams that have been devised to lessen collision hazard, nothing as yet has replaced fully the cardinal principle of seeing and being seen. This responsibility rests in cockpits. At uncontrolled airports, such as Lea County, the principle of "see and be seen" becomes of paramount importance. Experience has well domonstrated that the approach end of a runway at uncontrolled airports is the focal point of danger. There are two Civil Air Regulations that are pertinent to this collision.2/

2/ "60.12 Careless or reckless operation. No person shall operate an aircraft in a careless or reckless manner so as to endanger the life or property or others.

(c) Lack of vigilance by the pilot to observe and avoid other air traffic. In this respect, the pilot must clear his position prior to starting any maneuver, either on the ground or in flight."

"60.14 Right-of-way.

(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

It is obvious that full utilization of the principle of see and be seen could have prevented this accident. It is also plain that neither pilot did see the other's aircraft until only a very brief time before collision. The DC-3 was flown in such a manner that the Piper should have been within vision from the DC-3 cockpit for a substantial time interval until very shortly before the collision. The Piper was flown in such a manner that the DC-3 should have been visible from its cockpit except for a short period just before the crash (as it made a continuous turn from downwind to final). The Piper is a high-wing aircraft and although the right wing itself would not block vision during a left turn, its fuselage structure could have been interposed in the line of sight toward the DC-3 to the right, and as the Piper was the higher of the two aircraft during the final part of the approaches, this difference in altitude must have become increasingly significant - in reference to taking each aircraft out of the other's normal field of vision - as the paths of the aircraft intersected. Also, under the conditions of being in a forward slip to lose altitude and thus land short, Aishman must certainly have been looking ahead and down from the left side.

The concept of see and be seen requires that under conditions of visibility in which pilots can see other aircraft sufficiently to provide adequate traffic separation, pilots must assume complete responsibility against collision.

It is obvious that had either the pilots of the DC-3 or the pilot of the Piper exercised the continuous vigilance required by VFR flight during landing approach the other aircraft would have been seen in time to avoid collision.

The Board must therefore conclude that neither pilot was sufficiently vigilant and also that the Piper was not flown in full accordance with the airport traffic pattern.

2/ Continued.

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;

"NOTE: Passing an overtaken aircraft on the right is required because the pilot in side-by-side, dual-control aircraft is seated on the left and has a better view on that side. Further, in narrow traffic lanes, passing on the left of an overtaken aircraft would place the overtaking aircraft in the path of the oncoming traffic.

"(e) Landing. Aircraft, while on the 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.

"NOTE: Pilots must recognize that once committed to a landing in certain aircraft the pilot has little chance to avoid other aircraft which may interfere with that landing and, therefore, careful observance of this rule is important to the safety of all concerned."

It is probably true that the extremely small amount of air traffic at Hobbs Airport and the fact that neither aircraft was advised of the other's presence may have lessened the pilots' alertness.

As a result of this accident an intercommunication system has been installed between Continental's radio room and the CAA's radio office so that all traffic information can be quickly available to both.

Findings

On the basis of all available evidence the Board finds that:

1. The carrier, both aircraft, and all three pilots were properly certificated.

2. Neither weather nor the position of the sun was a factor.

3. The DC-3 was flown in accordance with company requirements and the local traffic rules.

4. The Piper was not flown in accordance with the local traffic rules.

5. There was an appreciable period during the final approach of the DC-3 when the Piper could and should have been seen from the DC-3.

6. Throughout the greater part of the approach of the Piper, the DC-3 could and should have been seen from the Piper.

Probable Cause

The Board determines that the probable cause of this accident was lack of sufficient visual alertness on the part of the pilots of both aircraft, and failure of the Piper pilot to comply fully with the local traffic pattern.

BY THE CIVIL AERONAUTICS BOARD:

/s/ ROSS RIZLEY

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

/s/ HARMAR D. DENNY

SUPPLEMENTAL DATA

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident at approximately 1500, August 29, 1955. An investigation was immediately started in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was ordered by the Board and was held in Hobbs, New Mexico, October 12, 1955.

Air Carrier and Piper Operator

Continental Air Lines, Inc., a Nevada corporation, maintains its principal offices in Denver, Colorado. The corporation holds a current certificate of public convenience and necessity issued by the Civil Aeronautics Board to provide transportation of persons, property, and mail over a number of routes including the route over which Flight 114 was operated. Continental Air Lines, Inc., also holds a valid air carrier operating certificate issued by the Civil Aeronautics Administration.

Hines Flying Service is a long established fixed-base operator domiciled at Hobbs, New Mexico, and is engaged in sales and service, instruction, dusting, charter, and pipeline patrol. The flight involved in the accident was returning from a charter trip.

Flight Personnel

Captain John R. Thompson, age 32, was employed by Continental Air Lines as a pilot on August 1, 1946. He holds a valid airman certificate with an air transport rating and type rating for DC-3 aircraft. Captain Thompson has, according to company records, a total of 7,705 pilot hours, of which 4,618 were acquired in DC-3 equipment. His last first-class physical examination was passed on June 27, 1955, and his last route check (including Lea County Airport) was on March 21, 1955.

First Officer Malcolm Edwards, age 24, was employed by Continental Air Lines as a pilot on June 20, 1955. He holds a valid airman certificate with commercial pilot, airplane single- and multi-engine, and instrument ratings. Mr. Edwards has, according to company records, a total of 479 pilot hours, of which 80 were acquired in DC-3 equipment. His last physical examination was passed on July 25, 1955.

Stewardess Patricia McDonald was employed by Continental Air Lines June 1, 1955. Her training was completed June 15, 1955, and assignment to flight duty was on June 18, 1955.

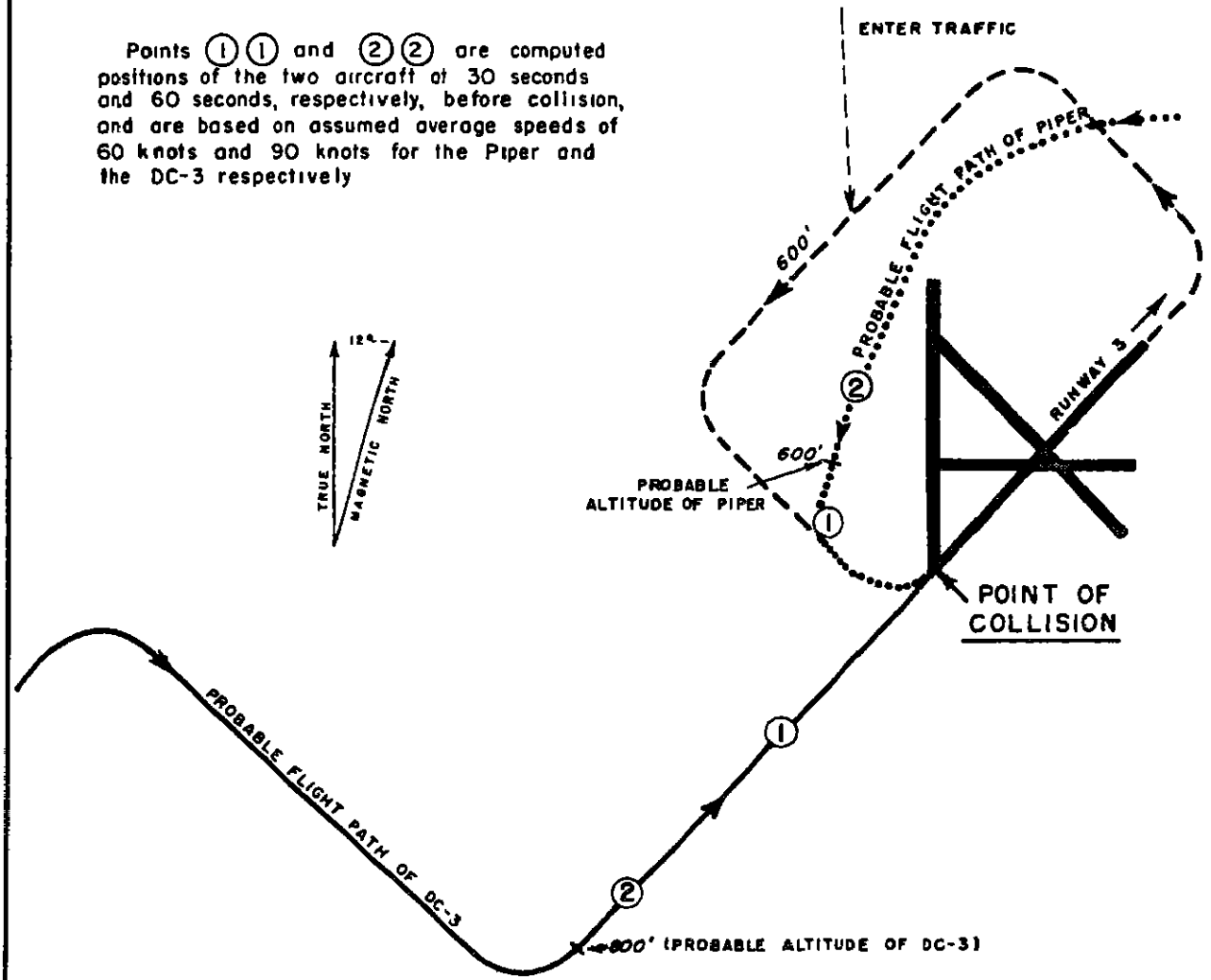
Pilot Otha Dalton Aishman, age 22, started his flight instruction with the Hines Flying Service on August 12, 1951. He received his commercial pilot rating on September 15, 1954, and was then employed as a pilot by the company. Mr. Aishman has a total of 495 flight hours, which includes 50 hours of T-33 jet time and 105 hours of T-28 and AT-6 time in the AFROTC. His medical certificate was current and listed no waivers.

The Aircraft

N 18945, a Douglas DC-3, serial number 2118, under lease to Continental Air Lines, was manufactured on April 28, 1938. It had a total airframe time of 50,837 hours and 160 hours since major overhaul. The aircraft was equipped with Pratt and Whitney S1C3G engines and Hamilton Standard model 23E50 propellers. Total time since new on the left and right engines was 305 and 131 hours, respectively. Total time on the propellers was 22,464 and 14,286 hours, respectively; time since overhaul of the propellers was 1,366 and 742 hours.

N 3334B, a Piper PA-22-135, serial number 22-2149, owned by the Hines Flying Service, was manufactured on April 4, 1954. Total time on the aircraft and engine since new was 370 hours. The aircraft was equipped with a Lycoming O-290-D2 engine, serial number 7029-21. The last annual inspection of the aircraft was on April 24, 1955.

Points ① ① and ② ② are computed positions of the two aircraft at 30 seconds and 60 seconds, respectively, before collision, and are based on assumed average speeds of 60 knots and 90 knots for the Piper and the DC-3 respectively



ATTACHMENT A

AIRPORT ALTITUDE 3659' M.S.L.

0 1/4 1/2 1 MILE APPROX

LEA COUNTY AIRPORT
HOBBS, N. M.

AIR COLLISION BETWEEN CONTINENTAL AIR LINES DC-3 N18945 and HINES FLYING SERVICE PIPER N3334B

AUGUST 29, 1955

COMM-DC-64602