

ACCIDENT INVESTIGATION REPORT

CIVIL AERONAUTICS BOARD

Adopted: October 10, 1949

Released: October 11, 1949

PAN AMERICAN AIRWAYS, INC. AND CESSNA 140—PORT WASHINGTON, LONG ISLAND, NEW YORK, JANUARY 30, 1949

The Accident

Pan American Airways' Flight 100, a Lockheed Constellation, aircraft NC-86530, and a Cessna 140, aircraft NC-76891, collided over Port Washington, Long Island, N. Y., at 1622,* January 30, 1949. The pilot and passenger in the Cessna were killed, and the aircraft was totally destroyed. None of 23 passengers or crew of 10 in the Constellation was injured, but the aircraft was substantially damaged.

History of the Flight

Pan American Airways' Flight 100 departed from LaGuardia Field, New York, N. Y., at 1616, January 30, 1949. Captain George F. Knuth flew as pilot, and First Officer Malcolm S. Wade flew as copilot. The aircraft carried 23 passengers, the crew of 10, a fuel load of 4,700 gallons, and 1,426 pounds of baggage and cargo. Total aircraft weight at time of takeoff was 101,336 pounds, which was within the certificated gross weight of the aircraft and properly distributed. The flight was cleared by CAA Air Traffic Control to proceed to the Shannon Airport, Shannon, Eire, on an Instrument Flight Plan, and to climb en route from LaGuardia to an altitude of 17,000 feet in accordance with Visual Flight Rules.

Approximately one hour before Pan American's Flight 100 departed from LaGuardia, at 1505, the Cessna 140 took off from Meriden Airport, Meriden, Connecticut, which is approximately 80 miles northeast of LaGuardia Field. So far as is known, Arthur R. Dutting, the owner of the aircraft, occupied the left seat and handled the controls, and Eugene Kowalczyk rode in the right seat as passenger. Before departing, Mr. Dutting and Mr. Kowalczyk stated that

they intended to fly to New York and return non-stop.

Between 1620 and 1622 both aircraft approached Port Washington, ten miles east of LaGuardia Field on Red Airway 23. The Constellation climbing en route at an indicated air speed of 175 miles per hour, was being held on an easterly heading of 95 degrees. It had taken off from Runway 31 at LaGuardia, after which the flight had turned right onto the first indicated course. Captain Knuth flew while Copilot Wade accomplished necessary cockpit checks and radio contacts. The Cessna, cruising at an estimated 108 miles per hour and at an altitude of 3,500 feet was flying the return course to Meriden of approximately 40 degrees.

Visibility conditions were good, the only restriction at 3,500 feet being a layer of light haze which reduced horizontal visibility to about five miles. The sun, setting to the rear of both flights, was 7-1/2 degrees above the horizon and at a computed azimuth of 239 degrees. Wind was from west-northwest at 10 miles per hour.

During this period, between 1620 and 1622, both aircraft were observed to converge without any apparent change in direction, or attempt to avoid collision, and the Cessna appeared to remain in level flight. They collided at an altitude of 3,500 feet over Port Washington. The Cessna's engine, propeller, landing gear, and seat structure entered into and remained in the fuselage of the Constellation, the remaining parts of the Cessna and a few fragments of the Constellation fell into the congested area of Port Washington. Immediately before the collision, Captain Knuth saw the Cessna, but at that time it was within the wing span of the Constellation to the right of and slightly above the cockpit. Although the control column was pushed sharply forward,

*All times referred to herein are Eastern Standard and based on the 24-hour clock.

nosedown, it was too late to avoid the impact.

Although the top of the Constellation fuselage forward of the cabin and aft of the flight deck was torn and crushed, the airplane continued to fly satisfactorily. An emergency landing was made at the Air Forces' Base, Mitchel Field, New York, 8 miles south of Port Washington. All occupants deplaned without difficulty, and no injuries to those in the Constellation were incurred as a result of the accident. The two occupants of the Cessna were killed at the time of impact.

Investigation

Damage to the Constellation resulting from the collision was confined to the top forward portion of the fuselage. Before the accident, the aircraft was in an airworthy condition with all components, including radio, operating normally. The windshield was clean. The only possible obstructions to vision were the aircraft structure itself and the magnetic compass which was mounted at the bottom center of the windshield. Unobstructed vision on a level plane is not available to either the pilot or the copilot in the cockpit of the Constellation. Aircraft structure between portions of the windshield restricts the crew's vision in certain limited areas.

So far as could be determined from aircraft records pertaining to the Cessna 140 and from those who were acquainted with the aircraft, it was also in an airworthy condition prior to the time of the accident. The windshield was clean and free of cracks. Relatively clear and unobstructed horizontal vision was available from the pilot's seat of the Cessna from straight ahead to 90 degrees to the left and almost vertical in a downward direction. The greatest portion of the Cessna wreckage fell in the congested area of Port Washington. This included the left and right wing panel, the engine cowl, fuel tanks, and the various parts of the empennage. The engine, propeller, and both landing gears of the Cessna, as stated above, remained inside the Constellation.

The bottom of the Cessna engine cowl left imprinted scuff marks on the top of the Constellation fuselage. The lines of these scuff marks when extended rearward so as to intersect the longitudinal

axis of the Constellation formed an angle of 38 degrees. An impression on the right forward side of the Constellation fuselage had been made by the left landing gear tire of the Cessna and in this impression was clearly stamped the trade mark of the tire manufacturer. The left landing gear strut, a solid piece of spring steel, left a clear outline of its shape in the skin of the fuselage where it had entered into the Constellation.

Both the front and rear left wing struts of the Cessna were crushed and curved to approximate the curvature of the Constellation fuselage. No crushing was found on the leading edges of these wing struts, but the trailing edges showed that they had been in direct contact with the Constellation.

The Cessna propeller entered the right side top of the Constellation fuselage near the window line and came out at the top of the fuselage just aft of the astrodome. One blade was relatively undamaged but the other was bent forward. The propeller was removed from the Cessna engine and placed in the slash that it had made. A line was placed in the center of the hub and extended to the intersection of the longitudinal axis of the Constellation, the angle of which measured 58 degrees.

At the time of the accident, no clouds existed below 15,000 feet, and the surface visibility on the ground was 10 miles or better. However, from the ground to 3,500 feet there was haze and smoke which was fairly evenly distributed to the area east of LaGuardia; winds aloft between 3,000 and 4,000 feet were from 320 degrees at 10 to 15 miles per hour. As previously stated, the sun at the time of the accident had an azimuth of 239 degrees and an altitude of 7.5 degrees.

Analysis

All evidence found in the examination of the wreckage, such as the scuff marks and the propeller slash left in the fuselage of the Constellation, showed that the two aircraft converged at an approximate angle of 58 degrees, the Cessna being to the right of the Constellation. This is supported by the fact that the difference between the heading of the Constellation, as testified to by the pilots, and the estimated heading for the Cessna on its return flight to Meriden,

was 55 degrees, or approximately the same as the above computed convergence angle of 58 degrees. As the two airplanes converged the Cessna was at a relative bearing of 38 degrees right from the Constellation, and the Constellation was at a relative bearing of 84 degrees left from the Cessna.

Because of the position of the two airplanes, the Cessna was behind structural members and the compass in the windshield of the Constellation, and could not be seen readily by either the pilot or the copilot. However, if they had shifted to the side in their seats, or leaned forward or backward, they could have cleared their line of vision so that the Cessna would have been observed. Consideration must also be given to the fact that the Constellation could have been seen from the Cessna, for the visibility in the Cessna from the pilot's seat extended in a horizontal plane from straight ahead to 90 degrees to the left and nearly vertical in a downward direction. Since both airplanes continued on collision courses until impact, it is reasonable to conclude that neither the pilots in the Constellation nor the pilot in the Cessna observed the other until immediately before the accident.

The Civil Air Regulations applicable at the time of this accident, visibility being five miles or better, required an aircraft which was overtaking another, or converging on another from the left, to give way. The same regulations also required an aircraft in level flight when 3,000 feet or more above the surface in a control area to fly at an even or odd thousand foot altitude as specified by the Administrator. In this particular case the Administrator had specified an odd thousand foot altitude. In addition to these specific regulations, the pilots in the safe operation of both aircraft were required to remain vigilant for the presence of other aircraft in their immediate vicinity.

It appears clear that the pilots in the Constellation were required not only to see the Cessna, but to avoid it. It also appears clear that the pilot in the Cessna was required to remain alert for the presence of other aircraft in his

vicinity, especially in view of the fact that he was crossing an airway in an area where heavy traffic could be expected. Furthermore, since the accident occurred at 3,300 feet in a control area at a time when the Cessna was observed in level flight, it appears that the Cessna was not being flown at a proper altitude. Therefore, it must be concluded that the failure of the pilots in both aircraft to remain alert in an area where heavy concentrations of traffic could be expected, resulted in this mid-air collision.

Findings

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

1. The air carrier, the aircraft, and the crews were properly certificated.
2. The Constellation and the Cessna were in an airworthy condition and operating without any mechanical trouble prior to the time of the accident.
3. At the time of the accident there were no clouds below 15,000 feet and visibility at 3,500 feet was five miles or better.
4. The Constellation was climbing to its approved cruising altitude of 17,000 feet at an indicated air speed of 175 miles per hour and on a heading of 95 degrees, during which time the Cessna, en route to Meriden, Connecticut, from New York, was flying a heading of approximately 40 degrees at an air speed of 108 miles per hour and at an altitude of 3,500 feet.
5. The two airplanes converged at an angle of 58 degrees and collided at an altitude of 3,300 feet over Port Washington, New York, on Red Airway 23,
6. During the period of time that the airplanes were converging at an angle of 58 degrees, the Cessna maintained a constant relative bearing from the Constellation of 38 degrees and the Constellation maintained a constant relative bearing from the Cessna of 84 degrees.
7. Neither the pilots in the Constellation, nor the pilot in the Cessna observed the other until immediately before impact though each aircraft could have been seen from the other.

Probable Cause

The Board determines that the probable cause of this accident was the joint failure of the Constellation pilots to observe and avoid the Cessna aircraft in flight, and of the Cessna pilot, while on an airway and in an area where a heavy concentration of traffic

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could be expected, to remain alert and avoid the Constellation.

BY THE CIVIL AERONAUTICS BOARD:

/s/ JOSEPH J. O'CONNELL, JR.

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ HAROLD A. JONES

/s/ RUSSELL B. ADAMS

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board received notification of the accident on January 30, 1949, at approximately 1655, by telephone from CAA Communications, LaGuardia Field, New York, and immediately initiated an investigation in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. As part of the investigation the hearing was held March 1, 1949, in New York.

Air Carrier

Pan American Airways, Incorporated, is a New York Corporation with head offices at 135 East 42nd Street, New York 1, N.Y. The company holds a certificate of public convenience and necessity authorizing it to engage in air transportation between New York, N.Y., and London, England.

Flight Personnel

Captain Knuth, age 31, held a currently effective airline transport rating and at the time of the accident had a total of 5,747 flying hours, 2,086 of which were in Constellation type aircraft. He had been employed by Pan American Airways since May 5, 1941. His last CAA physical examination was on November 24, 1948. First Officer Wade, age 34, held an airman certificate No. 26528 and an airline transport rating. At the time of the accident he had a total of 5,307 flying hours, of which 1,993 were in Constellation type aircraft. He was employed by Pan American Airways on June 1, 1943, and his last physical examination was accomplished on January 28, 1949.

Arthur R. Dutting, age 57, held a currently effective airman certificate

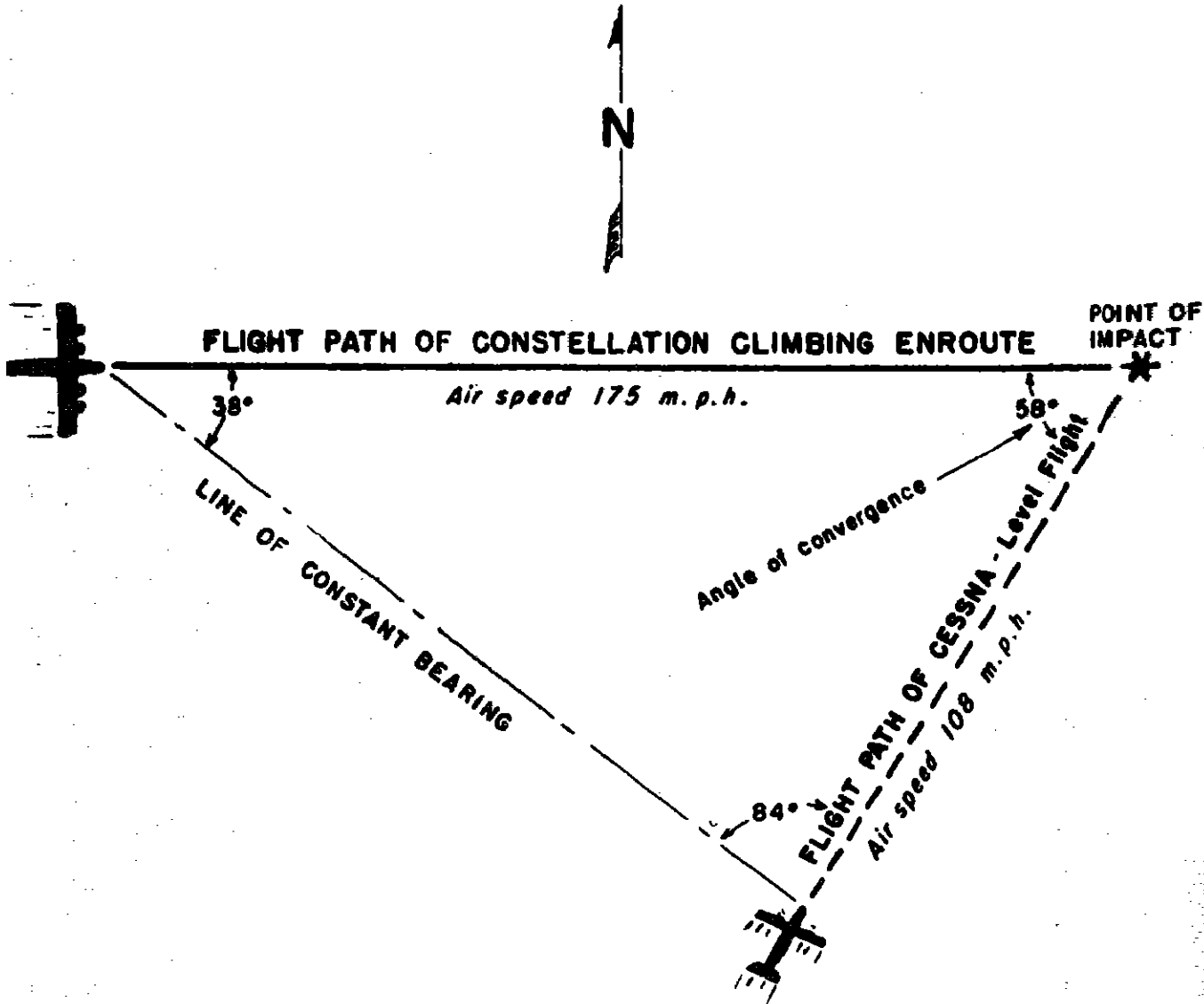
with a private pilot rating. At the time of the accident he had a total of 250 hours of flight time in light type aircraft. His last CAA medical examination was passed October 20, 1947. His CAA certificate showed that his vision was normal as corrected by glasses. Although it could not be determined that he was wearing glasses at the time of the accident, his glasses were found with his body. Eugene Kowalczyk, age 35, held a currently effective airman certificate with a private pilot rating. At the time of the accident he had a total of approximately 105 hours flight time in light type aircraft. His last CAA medical examination had been passed July 7, 1947.

The Aircraft

NC-86530, a Constellation, was an L-749, purchased June 28, 1947. The aircraft was owned and operated by Pan American Airways, Inc., and was currently certificated by the Civil Aeronautics Administration. It had been flown a total of 3,561 hours since the time of its purchase, and had accumulated 5:52 hours since last major overhaul. The four Curtiss-Wright engines, model No. 749C18BD1-2250, one through four respectively, had been flown 1,574, 1,618, 1,700 and 1,568 hours. The propellers were Curtiss Electric, model No. C632 SA14.

NC-76891, the Cessna airplane, involved in this accident, was currently certificated by the Civil Aeronautics Administration. The engine was a Continental C-85-12. Total time for aircraft and engine was 324 hours. The propeller was a McCauley 1A90 CF7148, and had a total time of 308 hours.

APPENDIX I



RELATIVE BEARINGS OF 38° CESSNA FROM CONSTELLATION, AND 84° CONSTELLATION FROM CESSNA, REMAIN CONSTANT THROUGHOUT PERIOD THAT BOTH AIRCRAFT ARE ON COLLISION COURSES.