

## CIVIL AERONAUTICS BOARD

**ACCIDENT INVESTIGATION REPORT**

Adopted: February 27, 1953

Released: March 4, 1953

TEMCO SWIFT AND AMERICAN AIRLINES, INC., DC-6 - DALLAS, TEXAS,  
JUNE 28, 1952

The Accident

At 0656, <sup>1/</sup> June 28, 1952, a privately owned Temco Swift, N 3858K, and an American Airlines' DC-6, N 90750, collided at about 400 feet altitude while both were approaching for a landing on Runway 13, Love Field, Dallas, Texas. The Swift fell in a left spin, striking the ground 4,410 feet northwest of the approach end of Runway 13. Both occupants of the Swift were killed; the DC-6 landed safely and no one on board was injured.

History of the Flights

Private Pilot Paul W. Brower and Passenger Don E. Walker departed Denton, Texas, in Mr. Brower's Swift between 0630 and 0640. Denton is about 33 miles from Love Field and almost in a direct line with Runway 13. Both occupants were employees of Central Airlines at Love Field, Dallas, and Mr. Brower had been commuting to work in his airplane almost daily for a period of several months.

While the Swift was approaching Love Field, a broken transmission was received by the controller in which only the words "straight-in approach" were heard. The aircraft was between the outer and middle markers at the time this transmission was made and less than 4.15 miles from the airport. Shortly thereafter, the Swift and DC-6, which were approaching for landing, collided. The left wing panel of the Swift was shredded by the No. 4 propeller of the larger aircraft. The Swift went over the fuselage of the DC-6, then spun into the ground. Both occupants of the small aircraft were killed and the aircraft was demolished.

The DC-6 operating as American Airlines' Flight 910 originated at San Francisco, California, at 2305 on June 27, 1952. Scheduled stops were made at three points en route, and the flight was uneventful until approaching Dallas. It was cleared IFR (Instrument Flight Rules) between El Paso, the last scheduled stop, and Dallas; however, since the weather was good, the captain cancelled his IFR flight plan and conducted this portion of the flight VFR (Visual Flight Rules).

Upon departure from El Paso at 0436 on June 28 there were 55 passengers, including four infants; five crew members, and 1,736 gallons of fuel aboard. The crew consisted of Captain G. H. Woolweaver, First Officer J. R. Poe, Flight Engineer J. W. Barrett, and Stewardesses A. R. Siebert and A. I. Schmid. The gross weight of the aircraft at departure was 2,082 pounds less than the

<sup>1/</sup> All times referred to herein are Central Standard and based on the 24-hour clock.

allowable 79,875 pounds, and the load was properly distributed with respect to the aircraft's center of gravity. First Officer James R. Poe was flying the aircraft from the right seat.

At 0650 Flight 910 reported over the Fort Worth radio range station at 5,000 feet MSL. The Flight changed from company radio frequency to Dallas tower VHF frequency at this time. Continuing VFR along the east leg of the Fort Worth radio range, the flight descended to 2,000 feet MSL. When south of Grapevine, Texas, the Dallas tower was contacted and clearance received to approach for landing on Runway 13.<sup>2/</sup> Immediately following this contact the landing gear was lowered and the flaps were extended to the 20-degree position.

A right turn was made to intercept the Dallas ILS (Instrument Landing System) for final approach. Following the ILS localizer and glide path, the aircraft passed over the outer marker at an estimated altitude of 1,500 feet MSL (1,017 feet above the ground) and shortly thereafter was given clearance to land. Cockpit checks had been completed, the aircraft was at an approach speed of approximately 130-135 miles per hour, flaps fully extended (50 degrees), and landing gear down. First Officer Poe was making the final approach down the ILS glide path and localizer and was maintaining visual reference to the ground as opposed to full simulation of an ILS approach. In accordance with company policy, no hood or any other device was installed to obstruct vision in any manner. During the final approach the pilots and the flight engineer of the DC-6 twice heard the tower give instructions to a light aircraft. Being thus alerted to the presence of another aircraft in the vicinity of the airport, they tried to sight it. At an altitude of approximately 400 feet, First Officer Poe, sitting in the right pilot's seat, sighted the Swift as it came into view from under the fuselage of the descending DC-6, almost abeam of his side cockpit window and slightly lower. In the fraction of a second remaining before the collision, he had insufficient time to take effective evasive action.

### The Investigation

Two passengers in the DC-6, both U. S. Air Force pilots, had an opportunity to observe the Swift for several seconds. First Lieutenant Phil C. Brockman was sitting in Seat 26, next to the window, in the left rear of the aircraft; Major Cody U. Watson was seated in the forward right portion of the cabin, next to a window, in Seat 5.

Lieutenant Brockman stated that the Swift first caught his attention when it was 45 degrees left of the DC-6 nose, 20 degrees low, less than 500 feet ahead, and on approximately a parallel course. The DC-6 was in straight descent at about 1,000 feet altitude and overtaking the Swift. Within a few seconds, when "the Swift was uncomfortably close," it turned to the right in approximately a 15-degree bank and disappeared from view underneath the left wing and fuselage. Lieutenant Brockman heard the two aircraft collide. A few moments later, he again saw it from his window in a left spin.

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<sup>2/</sup> See Attachment.

Major Watson saw the Swift as it came into view from under the DC-6. Initially, it was approximately 50 feet below the descending aircraft, slightly to the right, 150-200 feet ahead of the DC-6, and on the same general heading. The aircraft appeared to be in a 5-10 degree left bank; the wings of the DC-6 were level. The two aircraft converged and he felt an impact. The light aircraft swept back over the right wing panel and fuselage of the DC-6 and out of sight. Major Watson estimated that he had the Swift in sight only two or three seconds.

The observations of these two eyewitnesses, in addition to those of First Officer Poe, established that the Swift crossed the course of the DC-6 from left to right before the collision.

While delivering clearance for Flight 910 to land the Love Field tower controller heard a weak and broken message transmitted from an aircraft radio operating on either 3105 kilocycles or 122.5 megacycles. He heard only the words "straight-in approach." At about the same time, he saw a light aircraft in level flight at about 500 feet altitude and stated that it appeared to him to be about one-half mile behind the higher DC-6 then in its final approach. Both aircraft were on a southeasterly heading to the approach end of Runway 13 and both therefore presented a head-on view to him. The controller transmitted to the unidentified aircraft as follows: "AIRCRAFT CALLED LOVE TOWER BE NUMBER TWO TO LAND FOLLOW THE AMERICAN SIX THERE AHEAD OF YOU. RUNWAY ONE THREE WIND SOUTH SOUTHEAST TEN." This transmission was made immediately after the DC-6 was cleared to land No. 1. The DC-6 and the Swift appeared to be converging rapidly. Owing to the distance and the fact that the aircraft presented a head-on view against the clear sky, he believed the Swift was a Beechcraft Bonanza. Concerned about the convergence and still of the belief that the Swift was overtaking the DC-6 from the rear, the controller, only a very few seconds before the collision, advised as follows: "BONANZA GIVE WAY TO YOUR RIGHT OR LEFT. MAKE A RIGHT OR LEFT TURN IMMEDIATELY THERE." This transmission was made after the Swift had crossed the path of the DC-6 from left to right. The controller did not see the crossover. By the time he realized that there was imminent danger of collision, he had no opportunity to transmit precautionary advice to the pilots of the DC-6, in addition to the last instructions which he had given to the pilot of the smaller aircraft. It appeared to the controller that the pilot of the Swift immediately made an abrupt left bank following this transmission, and collision occurred immediately. He stated that the Swift appeared to be flying at constant altitude at all times before the crash. The controller testified that he did not learn that the Swift had not overtaken the DC-6, as was his impression, until investigation revealed that it was in front of the DC-6 during the entire period he had the Swift in sight.

Investigation disclosed that the controller had over six years' experience and his ability as a controller was entirely satisfactory. He had served in the Dallas tower since July 10, 1949 and in addition, held a currently effective commercial pilot rating; no physical defects or impairment of vision were found at the time of his last CAA Class II physical examination completed on June 9, 1952.

The approximate positions of the two aircraft at various points along their respective flight paths were obtained through statements and testimony of the DC-6 pilots, two passengers of the DC-6, cruise performance data for Swift aircraft, and the statements of ground eyewitnesses.

Examination of the Swift wreckage revealed that the aircraft initially struck the ground nose-down 80 degrees, right wing first, then came to rest on the lower side of the fuselage. The severed leading edge of the left aileron fell separately, striking a house located some 250 feet from the main wreckage; the left outboard aileron hinge also fell separately and was approximately 75 feet from the main wreckage. The landing gear and flaps were retracted. The altimeter was found set at 30.10 inches; this setting had been transmitted to another aircraft by the Love Field traffic controller at 0648. There was no evidence that any component part of the aircraft had malfunctioned or failed, with the possible exception of the VHF transmitter.

The shredded left wing panel revealed five propeller cuts progressing in succession from the trailing edge toward the leading edge of the wing panel. Study of the cuts indicated that the wing of the Swift was struck on the under surface and that the Swift was in a left bank upon collision.

The radio equipment installed in the Swift was too severely damaged by impact to determine its operating condition, with one exception. The Narco VHF transmission line connecting the transmitter to the antenna fell free from its plug during inspection. The portion of transmission line within the plug was covered by corrosion and since there was no evidence of a recent break in this connection, it was indication that it had not been properly soldered. This might account in part for the poor transmissions; however, investigation revealed that the transmitter and receiver operated properly during a flight made by Mr. Brower the night before the accident. A General Electric Model AS-1B transmitter-receiver was combined with the VHF transmitter. The GE transmitter was equipped with a crystal for transmission on 3105 kilocycles. The VHF crystals were found to be active and on frequency. The radio controls had been positioned as follows at the time of the accident: VHF transmitter on 122.5 megacycles, and receiver tuned to 278 kilocycles (Dallas tower frequency).

Damage to the DC-6 consisted of: Nicks and scratches in all three blades of No. 4 propeller; the high frequency radio antenna mounted above the fuselage between the vertical fin and roof of the cockpit, struck 22 feet forward of its rear mount and broken; damage to the antenna connecting cable and tension spool; and slight damage to the fin near the rear antenna mount.

The statements of passengers Watson and Brockman, observations of a ground eyewitness, and damage to the antenna definitely established that the Swift went over the fuselage of the DC-6 after being struck by the propeller.

It was also conclusively established that the DC-6 and the Swift were the only two airborne aircraft in the vicinity of Love Field and no other aircraft was landing or taking off.

Two traffic controllers were assigned to the 2400 to 0800 watch, as is the usual custom at Love Field. When the accident occurred, the second controller was temporarily absent. However, the controller on duty stated that he did not consider being alone imposed any handicap on his tower duties.

Although the flight had been en route for almost eight hours, both pilots of the DC-6 testified that they were mentally alert and were not physically fatigued. Their last CAA physical examinations revealed no physical defects or impairment of vision; the same was also true of Mr. Brower, the pilot of the Swift.

The sun at the time of the accident was 17 degrees high and five degrees to the left of the DC-6's heading. Weather was clear with thin, scattered clouds at 25,000 feet; visibility 15 miles or more, and wind south-southeast at 10 miles per hour.

### Analysis

The proximity of the two aircraft just before the collision, combined with the closing speed, made it impossible for the pilot of either aircraft to take effective evasive action. It is questionable that the pilots of either aircraft could definitely have seen one another between the outer marker and point of collision. Their actual relative positions cannot be conclusively established between these two points.

The Swift pilot either failed to indicate his intention to land while still some distance from the airport, or was unsuccessful in attempting a transmission to the tower. In any event, information necessary for initiation of positive traffic control was not received by the controller. A position report by the Swift would have enabled the controller to be apprised of the aircraft, its position, and approximate speed; thus he would have had time to properly space the two approaches. It could be expected that had the controller known the actual relative positions of the two aircraft, he would have been less likely to have made an error in depth perception (reversing the actual positions of the two aircraft).

The Swift was assigned No. 2 landing sequence shortly after the DC-6 passed over the outer marker and was given clearance to land No. 1. No further transmissions were made by the controller until he instructed the smaller aircraft to turn right or left and the accident occurred immediately thereafter. It is about three miles from the outer marker to the scene of the accident. There is no indication that the pilot of the Swift took adequate measures to locate the DC-6 either by a query addressed to the controller or efforts to clear the area visually. If the crossover (prior to the controller's final message) was made with the intent of locating the DC-6 it did not satisfy that purpose for the Swift pilot thus placed his aircraft in a position where collision was inevitable.

Since the Swift pilot had been commuting to Love Field for a number of months, he should have been aware of the local airport traffic rules, as required by Civil Air Regulations. One of these rules requires aircraft

equipped with a transmitter to call the tower while 10 minutes from the airport. Had the Swift pilot done this, there would have been ample time for him to comply with the tower's instructions to land No. 2 behind the DC-6. His message, transmitted somewhere between the outer marker and point of collision, indicated by the words "straight-in approach" that he intended to make such an approach. Owing to indications that the transmitter in the Swift was intermittently inoperative, it is not known whether an earlier transmission was attempted. The DC-6 radio contacts were made in accordance with approved operating procedures for the route.

If two-way radio contact could not be established, owing to radio failure, it was the duty of the Swift pilot to approach the traffic pattern with caution, complying with air traffic rules for VFR flight. Since two-way radio contact was not established, he should have proceeded with due regard to the possibility that other aircraft were in the area. It appears, however, that he proceeded inbound past the outer marker toward Runway 13 without exercising reasonable prudence in his approach.

Although the sun offered some restriction to visibility, the line of sight from the DC-6 during the period between Grapevine and the right turn to final approach would have been slightly downward rather than directly into the sun. Owing to the small size of the Swift and the distance, the aluminum skin probably blended into the light-colored terrain to an undetermined degree, thus making the Swift difficult to see.

During the right turn of the DC-6 the Swift could very well have been in a blind area to the crew of Flight 910. From this point on, cockpit structure and the nose of the DC-6 presented considerable restriction to vision. Investigation indicated that the Swift would not have been visible to the crew of Flight 910 until only a second or two before collision. The Swift's exact altitude, heading, and speed cannot be accurately ascertained. The pilots of the DC-6 were not aware of the presence of another aircraft in the area until they had reached the outer marker and had received clearance for landing. In the short time taken to fly from the outer marker to the point of collision, the pilots of the DC-6 tried to sight the other aircraft, but the Swift apparently remained in a blind spot forward and below the DC-6 nose structure, especially during the crossover. The Swift was in such a position relative to the DC-6, especially as the situation became more critical, that the pilots of the larger aircraft were unable to see it. Furthermore, from the time the controller advised the smaller aircraft to turn right or left there was insufficient time for the DC-6 pilots to search properly the area ahead, below, and to the sides of their aircraft. The first officer was of necessity directing most of his attention to instruments within the cockpit, since he was practicing an ILS approach without a hood. After the Swift made the crossover, it was continuously in a blind spot to the captain until only an instant before collision, when evasive action was impossible.

The DC-6 had received clearance to land No. 1, and such a clearance is an indication from the tower that the approach path is clear. This is one of the basic functions of airport traffic control. The crew of the DC-6, therefore, could reasonably have expected to be able to complete their approach and landing

without interference from other aircraft. A clearance does not relieve a pilot of the responsibility for maintaining vigilance. However, it appears that the crew of the DC-6 was maintaining an alert lookout, and did not act in a manner inconsistent with their responsibilities in failing to observe the other aircraft.

### Findings

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

1. The carrier, aircraft, and crew of the DC-6, and the Temco Swift and its pilot, were properly certificated.
2. Local weather at the time of the accident was: clear with thin scattered clouds at 25,000 feet, visibility 15 miles or more; wind south-southeast at 10 miles per hour.
3. The accident occurred at 0656 and at this time the sun offered some restriction to visibility.
4. Both aircraft were airworthy prior to collision.
5. American Airlines' Flight 910 had been cleared to land No. 1 from a straight-in approach to Runway 13.
6. The Temco Swift, assumed by the tower to be a Bonanza, was assigned No. 2 landing sequence when the tower controller assumed the small aircraft was to the left, rear, and lower than the DC-6.
7. When the controller anticipated the collision, he countermanded the clearance of the small aircraft to land No. 2 by instructing it to turn left or right immediately.
8. The relative positions and attitudes of the two aircraft at the instant the Swift first became visible to the first officer of the DC-6 made it impossible for him to take effective evasive action to avoid collision.
9. The two aircraft collided at approximately 400 feet altitude and 4,410 feet from the approach end of Runway 13 resulting in the destruction of the Swift; the DC-6 continued to a normal landing.

### Probable Cause

The Board determines that the probable cause of this accident was the Swift pilot's failure to exercise reasonable prudence in his approach, errors in judgment of the situation on the part of the controller were a contributing factor.

BY THE CIVIL AERONAUTICS BOARD:

/s/ OSWALD RYAN

/s/ JOSH LEE

/s/ JOSEPH P. ADAMS

/s/ CHAN GURNEY

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

### Investigation and Hearing

The Civil Aeronautics Board was notified of this accident at 0710, June 28, 1952, by telephone call from the Supervising Agent, CAA Aviation Safety District Office No. 4, Dallas, Texas. An investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing ordered by the Board was held in the Auditorium, Mercantile National Bank, 106 South Ervay Street, Dallas, Texas, on July 15 and 16, 1952.

### Air Carrier

American Airlines, Inc., is a Delaware corporation with general offices in New York, New York. It operates as an air carrier under a currently effective certificate of public convenience and necessity issued by the Civil Aeronautics Board, and an air carrier operating certificate issued by the Civil Aeronautics Administration. These certificates authorize the transportation by air of persons, property, and mail between various points in the United States, including points on Route 4, over which Flight 910 operated. This route includes, among others, the cities of San Francisco, California; Phoenix, Arizona, Tucson, Arizona; El Paso, Texas; and Dallas, Texas.

### Flight Personnel

Mr. Paul W. Brower, age 19, was employed as a station agent by Central Airlines at Love Field, Dallas, Texas. He held a currently effective private pilot certificate issued on June 25, 1952. His last Class 3 CAA physical examination, completed on June 29, 1950, listed no structural physical defects. His application for a private pilot rating, dated June 25, 1952 (the same day he passed the flight test) reflected 250 flight hours in single-engine land aircraft, of which 20 hours were dual instruction; flight time in the Temco Swift was shown as 100 hours total, with 92 hours as pilot-in-command.

Captain G. H. Woolweaver, age 47, was employed by American Airlines on March 9, 1932, as a dispatcher. He served as a station agent for one month in June 1934, and became a copilot on July 11, 1934. He received successive promotions as a pilot and had been continuously employed as a captain since October 1, 1936. Captain Woolweaver had accumulated 16,304 flying hours at the time of the accident, of which 4,000 were in the DC-6. He had flown 81 hours in the 30 days preceding the accident and had 20 hours and 20 minutes rest period before departing San Francisco with Flight 910. His last CAA physical examination, completed on February 28, 1952, reflected no waivers and listed no physical defects, including vision. Captain Woolweaver possessed a CAA airman certificate and airline transport pilot rating No. 7683.

First Officer James R. Poe, age 38, was employed as a first officer trainee by American Airlines on March 8, 1943, and upon completion of training was assigned to first officer flight duties on July 3, 1943. He had accumulated

a total of 7,400 flying hours, of which 1,800 were DC-6 time. Mr. Poe had flown 82 hours and 55 minutes in the 30 days preceding this accident and had 20 hours and 20 minutes rest period before departure of Flight 910. His last CAA physical examination, completed on March 27, 1952, listed no waivers or any physical defects, including vision. First Officer Poe possessed a CAA airman certificate with airline transport rating No. 128260.

### The Aircraft

N 3858K, a Temco Swift, model GC 1B, serial number 3558, was manufactured on May 24, 1948, and was owned by Mr. Brower. It was equipped with a Continental 125 horsepower engine, model C-125-2, serial number 1286-6-2. The propeller was a Koppers Aeromatic, model OO-73E. The aircraft was currently certificated to September 10, 1952. The last annual inspection on N 3858K was completed on September 10, 1951, and a 100-hour inspection was accomplished on March 11, 1952.

N 90750, a Douglas DC-6, was owned and operated by American Airlines, Inc., and had a currently effective CAA airworthiness certificate when the accident occurred. It was equipped with Hamilton Standard propellers. As a result of the accident, No. 4 propeller was replaced by another on July 28, 1952, the top antenna and fittings were repaired, and the aircraft was released for further service.