

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: November 5, 1951

Released: November 13, 1951

SOUTHWEST AIRWAYS COMPANY—14 MILES NORTHWEST OF SANTA BARBARA,
CALIFORNIA, APRIL 6, 1951

THE ACCIDENT

Southwest Airways' Flight 7 of April 6, 1951, a DC-3, N-63439, crashed 14 miles northwest of Santa Barbara, while en route there from Santa Maria, California, at about 2030 PST.¹ All occupants, 19 passengers and three crew members, were killed and the aircraft was demolished.

HISTORY OF THE FLIGHT

Flight 7 originated at San Francisco, for Los Angeles, with stops scheduled at San Jose, Watsonville, Monterey, Paso Robles, San Luis Obispo, Santa Maria, Santa Barbara, and Oxnard, all in California. Departure from San Francisco was 1800, 15 minutes behind schedule, under a Visual Flight Rules company clearance but with authorization, sufficient fuel, and properly designated alternate airports for instrument flight into, and out of, any of the planned stops. The flight plan specified different altitudes for the several legs of the flight; the altitude specified for the leg on which the accident occurred (Santa Maria—Santa Barbara) was 4,000 feet. The clearance and flight plan was accompanied by weather information and the crew was briefed before departure by the company's flight superintendent on weather conditions to be expected.

Flight 7 proceeded in a routine manner and landed at Santa Maria at 2010. All previous scheduled stops had been made with the exception of the one at San Luis Obispo, which was passed over because of local weather.

Departure from Santa Maria was at 2018, 12 minutes behind schedule, and the aircraft

was loaded within its certificated weight limit and center of gravity specifications. The distance from the Santa Maria to the Santa Barbara airport, direct, is only 47.5 miles. The company's operation manual specified three different routes over this segment. The course specified on the flight plan was via Capitan, a coastal town.² This course was entered in the company's operation manual on March 13, about three weeks before the accident. It was within the 10-mile corridor centered by one of the approved routes. (Route B, via Beacon No. 10.)

Two minutes after takeoff from Santa Maria the flight radioed its on and off times to and from that station and gave an estimated arrival time of 2039 at Santa Barbara. This was the last radio contact with the flight, and complete search procedures were shortly placed in effect. The wreckage was located the following morning at about 1030.

INVESTIGATION

The aircraft struck the gradually rising slope of a ridge while on a heading of about 117° magnetic. This direction was readily ascertained from a sharply defined path of cut and broken brush. The site was approximately 34° 31' 30" North Latitude and 120° 02' West Longitude, a point about three miles to the right of a straight line between the Santa Maria and Santa Barbara airports. Such a straight line has a direction of 115° magnetic. This point is also about one and one-half miles to the left of the course between Santa Maria Airport and the town of Capitan. At the time of the impact the DC-3 was about level longitudinally and the left wing was raised above the horizontal by about 30°. The top of the ridge was only a

¹All times referred to herein are Pacific Standard based on the 24-hour clock.

²Refer to attachment.

short distance ahead of, and some 40 feet higher than, the point of initial impact which was at an elevation of 2,740 feet MSL.

General disintegration and fire followed the crash, largely destroying the structure. Examination of the wreckage indicated that there had not been any fire in flight and that there had been no malfunctioning of the aircraft, aircraft's controls, engines or its propellers, prior to impact. From the severely broken and burned wreckage it was, nevertheless, possible to deduce with a high degree of probability that, at the time of initial impact, the wing flaps and the landing gear were up and the propellers were in the cruising RPM range. One recovered altimeter indicated an altitude of 2,800 feet, and one rate of climb indicator showed zero; other flight instruments gave meaningless indications or were unreadable. A search of the ground over which the aircraft had flown just before impact failed to yield any material or objects from the aircraft. All indications were that the aircraft was in controlled cruising flight when it struck.

All navigational aids that could possibly have been involved in this leg of the flight were checked on the day following the accident. All were found to be functioning normally. Furthermore, Southwest Airways Flight 5, immediately behind Flight 7, later reported that it had no difficulty with such navigational aids. Investigation did not reveal any malfunctioning of the aircraft's radio apparatus.

At the time of the accident, a high pressure area prevailed off the Pacific Coast with an onshore pressure gradient to relatively low pressure over the desert regions inland. This situation, common in spring and summer, caused a flow inland of cool maritime air along the entire route from San Francisco to Los Angeles. The depth of this maritime air ranged from about 3,000 feet in central California to about 5,000 feet in the Los Angeles area. No frontal activity existed along the route. Broken to overcast stratus clouds lay along the coast, in the coastal valleys, and against the nearby mountains.

At the time of departure from Santa Maria, the latest weather reports showed an overcast there at 2,400 feet and a visibility of 20 miles; 3,100 feet and 15 miles visibility at Santa Barbara; 1,800 feet and 15 miles at

Oxnard; and 3,500 feet and 15 miles at Burbank (Los Angeles). Forecasts indicated that the flight could expect mostly overcast from Santa Maria to near Santa Barbara, with cloud bases at 1,800 and 2,000 feet MSL, and scattered to broken clouds with bases at 3,500 feet at Santa Barbara.

Evidence disclosed by investigation indicates that a solid overcast existed between Santa Maria and the general area of the crash site. The flight must have gone on instruments when reaching an altitude between 2,000 and 2,400 feet MSL after leaving Santa Maria because the stratus base there was at that altitude. It is further indicated that the cloud base was on the terrain at the time and place of the crash, and that the top of the stratus layer was at an altitude of about 3,500 feet.

The winds aloft were light, being about 300 degrees, 4 miles per hour at 2,000 feet, 360 degrees, 2 miles per hour at 3,000 feet. Aircraft icing could not have been a factor as the cloud layer was well below the freezing level. The air was too stable to produce other than light turbulence and the wind was too light to produce local pressure variations that would cause erroneous altimeter readings of any consequence.

The altitude of the top of the overcast is well substantiated by reports from the pilots of other aircraft in the general area at or about the time of the crash, including Flight 5 of the same carrier, over the same route, with stops at both Santa Maria and Santa Barbara, and scheduled 40 minutes behind Flight 7. Its pilot flew at his assigned altitude of 4,000 feet between those two stops. At that altitude he was completely above the stratus layer. However, he flew to the right, or west, of the center of Route B, as shown on the attachment, rather than the Capitan course, because as he explained it, there was no moon at the time and he wished to assure himself of clearing the higher ground to the east. The first leg of the course from Santa Maria to Santa Barbara via Beacon 10 is 132° M; via the town of Capitan it is 123° M.

ANALYSIS

The weather over the route and in the vicinity of the crash was substantially as forecast, without turbulence, icing, or winds of any strength. It was, in fact, the

commonly prevailing seasonal condition. Therefore, the Board concludes that existing weather should not have had any bearing on this accident.

The pilot had flown the route no less than 1,300 times and knew it and its weather thoroughly. The question arises as to why he was at an altitude of some 2,740 feet when his flight plan called for 4,000 feet, where he would have been completely above the overcast. The only possible answer, nevertheless conjectural, is that he had been attempting to fly under the overcast and did not see the ground in time. Thus it appears that this accident may be attributable to an attempt to save a fractional amount of flight time. Reference to the attachment will make clear the small distances involved and the inconsequential saving of flight time affected by not following prescribed procedures.

An explanation of why the left wing was raised is found in the nature of the terrain. It rose gradually ahead of the crash site, but it rose much more sharply to the aircraft's left. This could well account for a last instant attempt to lift the wing over the slope.

In reference to routes between Santa Maria and Santa Barbara, the company's operations manual sets forth three routes, all approved by the Civil Aeronautics Administration. The three approved routes, used under different conditions of weather, are shown on the attachment and described as follows:

Route A. This route is from Santa Maria Radio Range Station (privately owned and operated) to Santa Barbara, via the south course of the Santa Maria Range and the West course of the Santa Barbara Low Frequency Radio Range. The point of intersection of these two radio range courses is known as the Gaviota Intersection. This route is authorized both day and night, contact and instrument. The segment from Santa Maria to Gaviota Intersection is off airways and minimum instrument altitudes have been established as 5,500 feet southbound and 4,500 feet northbound. These altitudes provide at least 2,000-foot terrain clearance 5 miles either side of the course center line and conform with Civil Air Regulations relative to off airway instrument flight levels. The minimum night VFR altitude for this segment

is 4,000 feet. The segment from Gaviota Intersection to Santa Barbara is on airway with minimum instrument altitudes of 5,000 feet eastbound and 4,000 feet westbound. The minimum night VFR altitude for this over ocean segment is 2,000 feet.

Route B. This route is from Santa Maria to Santa Barbara via Beacon 10 and is authorized for day and night VFR only. Instrument operation over this route day or night is not authorized. The established night VFR minimum en route altitude is 4,000 feet.

Route C. This route lies within the confines of Airway Amber 8 with instrument en route minimum of 7,000 feet northbound and 8,000 feet southbound as published in the Civil Aeronautics Administration Flight Information Manual. The established VFR en route minimum for night operation is 6,500 feet.

The course being flown, via the town of Capitan, is shown by a dotted line on the attachment. It was entered into the company's operational manual about three weeks before the accident, and was removed from the manual, by the carrier, immediately after the accident. However, this course was not in conflict with the pertinent provisions of the Civil Air Regulations inasmuch as it was within five miles of an approved route³—a route being defined as a strip 10 miles wide. Although the flight was confined to the limits of an approved route, the altitude at which the crash occurred, 2,740 feet, was markedly below the approved night minimums of 500 feet on top, and no lower than 4,000 feet, as prescribed in the company's operating specifications and approved by the Civil Aeronautics Administration. It appears that this was in conflict with the Civil Air Regulations.⁴

The Capitan course had been in use by the carrier for a considerable period before it was entered into their operations manual. The reason for entering this course was to

³ Route B, as shown on the attachment.

⁴ Section 61.23 of the Civil Air Regulations, provides that: "The conduct of operations by a scheduled air carrier shall at all times be in strict accordance with the terms of its air carrier operating certificate."

make the manual consistent with company practice. Actually, the Capitan course is about three miles shorter than the Beacon 10 course.

In conclusion, it could be that the pilot's long familiarity with the route may have led him to believe that he could fly the more direct course, under the overcast, through Refugio Pass, where the accident occurred. Again, the carrier's known and long-practiced highly efficient methods on this multi-stop, short-haul operation, involving absolute minimum of time on the ground, and the use of time-saving techniques, may have induced a disproportionate need for haste in the pilot's mind. In this connection it must also be remembered that the subject flight was 15 minutes late out of San Francisco and 12 minutes late out of Santa Maria. This fact may well have had some bearing upon the pilot's attempt to make up time, particularly as another company flight (No. 5) was following him and left San Francisco only 29 minutes after he did.

FINDINGS

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

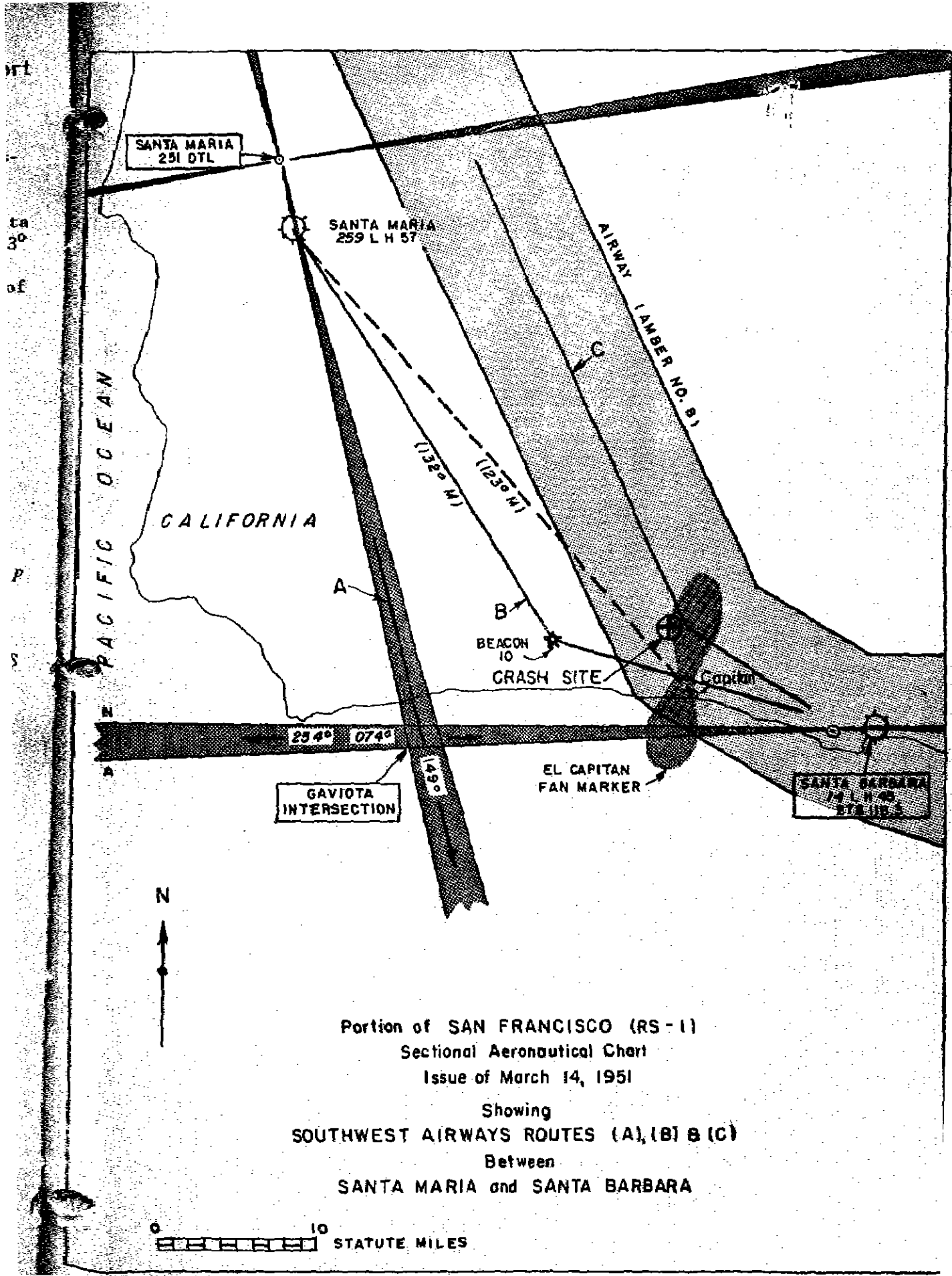
1. The company, the aircraft, and the crew were properly certificated.
2. There was no irregularity in the dispatching of the flight.
3. The flight plan called for a VFR operation at 4,000 feet altitude between Santa Maria and Santa Barbara and a course of 123° M as far as Capitan.
4. The aircraft crashed at an altitude of approximately 2,740 feet while on a course of approximately 117° M, during instrument weather.

PROBABLE CAUSE

The Board determines that the probable cause of this accident was the failure of the flight, for undetermined reasons, to maintain the specified minimum en route night altitude of 4,000 feet for the route being flown.

BY THE CIVIL AERONAUTICS BOARD:

/s/ DONALD W. NYROP
 /s/ OSWALD RYAN
 /s/ JOSH LEE
 /s/ JOSEPH P. ADAMS
 /s/ CHAN GURNEY



Portion of SAN FRANCISCO (RS-1)
 Sectional Aeronautical Chart
 Issue of March 14, 1951

Showing
 SOUTHWEST AIRWAYS ROUTES (A), (B) & (C)
 Between
 SANTA MARIA and SANTA BARBARA

Supplemental Data

INVESTIGATION AND HEARING

The Civil Aeronautics Board was notified of this accident promptly through CAA Communications. 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 was ordered by the Board and was held in San Mateo, California, on April 26, 1951.

AIR CARRIER

Southwest Airways Company was incorporated under the laws of the State of Arizona in 1941. The company is engaged in the transportation by air of persons, property and mail, as authorized by the certificate of public convenience and necessity issued by the Civil Aeronautics Board on May 22, 1946. Southwest Airways also holds an air carrier operating certificate No. 601, issued by the Civil Aeronautics Administration on December 21, 1946.

FLIGHT PERSONNEL

Captain Knox L. Pittman, age 35, was employed by Southwest Airways on September 23, 1946. He had received previous training in the United States Air Force. He was promoted to a captain on December 12, 1946, and had flown as regular captain since that time.

Captain Pittman had a total flight time of 9,317 hours, 340 hours of which were instrument. He had passed his last CAA physical examination on February 26, 1951, and had successfully passed his last instrument check. He held a valid airline transport pilot rating 55719-41, instructor.

First Officer Robert J. Erichsen, age 35, was employed by Southwest Airways on February 13, 1951. He had received previous training in the United States Air Force. Mr. Erichsen had a total flight time of 4,850 hours, 154 of which were instrument. He had successfully passed his last CAA physical examination on February 12, 1951. He held a valid commercial certificate No. 37485 with instrument, single and multi-engine land ratings.

Purser Grant Peterson was employed by Southwest Airways on January 3, 1951.

THE AIRCRAFT

N-63439 was a Douglas C-47A and had a total of 4043:25 flight hours when purchased from War Assets Administration and converted to a DC-3C. At the time of the accident, N-63439 had 8132:19 total flight hours since overhauled. The aircraft was equipped with Pratt & Whitney R-1830-92 engines and Hamilton Standard Hydromatic propellers.