

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted: September 14, 1950

Released: September 15, 1950

TRANSOCEAN AIR LINES, INC., SHANNON, IRELAND, AUGUST 15, 1949

THE ACCIDENT

Aircraft N-79998, a DC-4 operated by Transocean Air Lines, Inc., a nonscheduled carrier, was ditched¹ at an estimated position of 52 degrees 53 minutes north latitude, and 9 degrees 39 minutes west longitude, approximately seven miles² northwest of Lurga Point on the Irish Coast, at 0240,³ August 15, 1949. Of the 49 passengers and crew of nine, eight fatalities resulted which included one crew member.

HISTORY OF THE FLIGHT

The flight departed from Rome, Italy, at 1608, August 14, 1949, carrying 49 passengers and a crew of nine, 2,260 gallons of fuel, and 2,750 pounds of baggage and cargo. Aircraft weight at time of takeoff was 68,646 pounds, which was within the allowable limit of 70,700 pounds. No information is available as to whether the aircraft was properly loaded with respect to its certificated center of gravity limits. According to the instrument flight clearance filed with Rome Air Traffic Control, the planned route was to Marseille, France, at an altitude of 10,500 feet, then direct to Shannon, Ireland, at an altitude of 8,500 feet. Orly, the principal commercial airport at Paris, France, was designated as the flight's alternate. Clear weather and light to moderate winds over the proposed route were predicted.

Takeoff from Rome was made by First Officer Hall as pilot with Captain Bessey serving as copilot. After leveling off at 8,500 feet, 2,000 feet below the planned cruising altitude to Marseille, Captain Bessey retired

¹Landing a land aircraft on water

²All distances stated in this report are expressed in nautical miles and all speeds are in knots, nautical miles per hour

³All times stated in this report are Greenwich Standard Time and based on the 24-hour clock

to the crew's quarters, and the flight continued with First Officer Hall flying as pilot. Second Officer John Moore was copilot, James Raumann was navigator, Robert D. Thomas and Herbert Ashbell were radio officers, and Ralph Fisher and Luigina Cerabona were flight attendants. The ninth member of the crew, Ruth Nichols, had no assigned duties.

Except for the fact that the number 3 engine operated roughly when the mixture was in auto lean, the flight progressed without incident. At approximately 2300, the flight descended to 3,500 feet, which was above a layer of stratus clouds.

The original ETA (estimated time of arrival) of 0021 over Shannon was revised several times en route, but all such times passed without the flight observing the Shannon Airport. Actually, although unknown to the crew, at 2300 the aircraft had been flown beyond Shannon and was over the North Atlantic. It was not until 0050 or later that a turn was made for the return course to Shannon.

At 0106 the flight alerted Air-Sea Rescue facilities at Shannon and gave its position as 100 miles west of Shannon, flying inbound on a track of 80 degrees. Ground speed was estimated to be 140 knots. The flight continued toward Shannon until 0240 when all fuel was exhausted, and at which time the aircraft was ditched, seven miles northwest of Lurga Point on the Irish Coast. No use was made by the flight of 500 KC's, the International Distress Frequency.

The aircraft remained afloat for about 15 minutes, during which time the crew and the passengers removed and manned all but one of the life rafts. Aircraft circling over the life rafts were able to direct the British trawler "Stalberg" to the scene. All rescue operations were completed shortly after

daylight of August 15, 1949 Seven passengers and one crew member died as a result of exposure or drowning, all others were successfully rescued (See chart Appendix I for flight path)

INVESTIGATION

Because the flight documents, logs, navigational charts and instruments were lost when the aircraft sank, the navigational data are not complete, and depend entirely upon recorded radio transmissions, weather reports, and testimony of the crew

The crew arrived at Ciampino Airport, Rome, Italy, 30 minutes later than they originally planned To conserve time, Captain Bessey divided pre-flight duties among the crew He, Navigator Baumann, and Second Officer Moore obtained weather data from the local weather office Second Officer Moore then prepared the flight clearance which was filed with Rome Air Traffic Control First Officer Hall made out the weight and balance manifest, Captain Bessey went to the aircraft, and Navigator Baumann computed his flight plan based on a route to Shannon via airways and over Paris The navigator and the first and second officers did not confer nor did either the navigator or second officer have knowledge of the correct aircraft weight and fuel load until after the flight documents were completed and they had reported to the aircraft Captain Bessey did not examine any of the documents before take-off

Second Officer Moore indicated on the flight clearance that the aircraft carried 16 hours of fuel The navigator based his flight plan on 12 hours of fuel After these two crew members reported to the aircraft they discovered that only 11 hours, or 2,200 gallons, of gasoline were on board⁴ This amount at a consumption rate of 200 gallons per hour, a standard estimate of the company, was not sufficient for the required fuel reserve of two hours normal cruise⁵ after flight to Shannon and then to the alternate,

⁴ An additional 60 gallons of fuel were discovered in a fuselage tank and consumed just before ditching

⁵ Sec 42.52 of the Civil Air Regulations "(b) Outside the United States (1) No flight shall be started unless, considering the wind and other weather conditions expected, the aircraft carries sufficient fuel and oil (1) to fly to the next point of landing specified in the flight plan, (11) thereafter to fly to and land at the most distant alternate airport designated in the flight plan, and (111) thereafter to fly for a period of at least 2 hours at normal cruising consumption"

Orly But, because weather conditions were predicted to be relatively clear, it was decided by the captain and his crew that there was sufficient fuel, and that Dublin, Ireland, would be the alternate airport It was also decided to fly to Shannon direct from Marseille rather than over airways and via Paris as planned by Navigator Baumann The change in alternate airport was not transmitted to Rome Air Traffic Control

The flight reported over Marseille at 1820, and over Rennes, France, at 2050 Between Marseille and Rennes a heading of 330 degrees was maintained at an altitude of 8,500 feet Approximately 15 minutes after ETA over the French Coast, the French Coast was observed below The navigator then obtained a three star fix which according to his testimony was plotted at 48 degrees 55 minutes north latitude and 3 degrees 30 minutes west longitude This is a position a few miles north of the French Coast, 53 miles northeast of Prest, and 15 miles west of the flight's intended track No exact information as to the time that the aircraft was over the French Coast or the time for the fix is known

While Navigator Baumann was engaged in either plotting the celestial fix or in other navigational duties which followed, Captain Bessey returned to the flight deck First Officer Hall had been attempting to secure radio bearings, and although radio reception was poor, he was able to obtain a satisfactory signal from Brest, which was on a relative bearing of 215 degrees Hall also observed a second coast line ahead Shortly after the bearing was obtained by Hall, Captain Bessey asked the navigator if they were not just south of the Cherbourg Peninsula, and if the Channel Islands were not off to the right to which Baumann answered in the affirmative Again, there is no definite information as to the time, but Hall stated that he observed the radio bearing on Brest about 20 minutes after they had passed over the French Coast

Navigator Baumann estimated ground speed from Marseille to the celestial fix to be 138 knots On this basis, he estimated arrival over Land's End to be 2233 and over Shannon to be 0010 Baumann made a second estimate of ground speed based on time from the celestial fix off the French Coast to what he identified to be Land's End, the southern tip of Wales This estimate was 160 knots, so he

recomputed the ETA over Shannon to be 2345. During all of this time the heading of 330 degrees was maintained.

The flight transmitted to Shannon Radio that it was over Land's End at 2227. Shortly after, a course of 310 degrees was held, and the flight descended to 3,500 feet, which was above a layer of clouds. Navigator Baumann stowed his navigation equipment, then drew on his chart the courses of the Shannon radio range which was being received, the signal being that of an "A" quadrant. Baumann stated that he inadvertently labeled the southeast sector of the range "A" rather than "N," so he believed because of the "A" signal that they had not passed Shannon. The navigator then gave to Captain Bessey a new ETA for Shannon of 0010.

After 0010 the flight proceeded at reduced power on a heading of 310 degrees and the navigator attempted at the captain's request, but without success, to obtain a Loran fix. Then, between 0030 and 0040 he obtained a three star celestial fix which, when plotted, placed the aircraft at a position 175 miles northwest of Shannon. On the basis of this fix, a heading of 130 degrees was recommended to the captain for return to Shannon. At approximately 0050, the aircraft was turned to a southerly heading for a few minutes after which the recommended heading of the navigator, 130 degrees, was flown. The west course of the Shannon range was intercepted at 0114, then followed inbound. At this time, only about one hour and 30 minutes of fuel remained. The aircraft had been in the air a total of nine hours and six minutes.

Other flights which were in the Shannon area at the same time reported that radio reception from navigational aids in the vicinity of Shannon was normal. They also reported that Shannon remained relatively clear during the night, and that a broken layer of stratus extended west from the West Irish Coast for 500 miles. It was estimated that the bases of these clouds were 400 to 500 feet above the surface, and the tops at an altitude of 1,200 feet.

At the time of this flight a cold front extended east-northeastward across Northern Ireland, Scotland, and Denmark, but no fronts existed along or across the flight's route from Rome to Shannon, and there was relatively clear weather with light to moderate winds. When the forecast information was

given to the crew at Rome, it was given for a route to Shannon by way of Paris. Accordingly, the flight folder which was prepared by the local weather office did not contain specific wind information for the direct route. Forecasted winds at 8,000 feet for the route by way of Paris were from the north-northeast at 20 knots from Rome to Corsica, from the north-northeast 20 to 25 knots from Corsica to Nancy, and then from the west about 30 knots to Shannon.

An aftercast of existing weather showed that over the route flown there were scattered cumulus clouds and good visibility. Winds were Rome to Marseille from the north at 18 knots, Marseille to Limoges, France, from the northeast at 18 knots, Limoges to Rennes from the east-northeast at 23 knots, Rennes to Land's End light and variable winds, and from Land's End to Shannon from west-southwest at 20 knots. Shannon was clear with the exception of a few patches of ground fog. A broken layer of clouds extended westward over the Atlantic Ocean from the west coast of Ireland, and winds at 3,500 feet west of Shannon were from the southwest at 18 knots. No icing conditions prevailed over any part of the route, and the air was generally smooth. Temperatures at cruising altitude averaged 6 degrees centigrade. Several weather stations were located within 100 miles of the route flown between Marseille and Rennes, but no attempt was made by the flight to obtain weather or wind information from these stations.

Sunset for August 14, 1949, at latitude 46 degrees was 1903 with twilight for 32 minutes. Moonrise for latitude 49 degrees was 2139.

According to the company's Flight Operation Manual, the captain when outside the continental limits of the United States, acts not only in the capacity of a pilot in command of an aircraft but also as a dispatcher. He is charged with supervising flight planning, and although he may delegate pre-flight duties to various crew members, he remains responsible for the proper preparation and checking of flight plans, clearance forms, weight and balance manifests, and all other documents required for a safe routine operation. Also in accordance with the company's Flight Operation Manual, the captain, as commander of the aircraft, is responsible for the proper discharge of all flight

duties This includes a periodic check of cruise control charts, navigator's flight charts, and flight logs

All crew members including Captain Bessey had a period of four days in Rome to rest before making this flight ⁷

ANALYSIS

Since the navigational logs and charts were lost, it is not possible to reconstruct the precise flight course However, from what information is known, it appears that the track described below was the one probably flown

There can be little question that the aircraft passed over Marseille at 1820 as was stated in the flight's routine position report It was then daylight, and Marseille is a large city on the coast and should have been easy to identify visually In addition, at Marseille there was a radio range station from which a positive position could be obtained Accordingly, Marseille can be accepted as one point over which the aircraft flew But, none of the other radio position reports received from the flight seemed to be consistent with known facts

The flight's report over Rennes at 2050 cannot be correct If it were, a ground speed of only 155 knots would have been made from Marseille, and it is clear that the ground speed was substantially greater Considering the weight of the aircraft, the fuel consumption of about 200 gallons per hour, the cruising altitude of 8,500 feet, and the temperatures at cruising altitude which averaged 6 degrees centigrade, the aircraft, according to the company's cruise control charts, should have had a true air speed of at least 180 knots This air speed in conjunction with the winds existing over the route would have resulted in a ground speed of approximately 181 knots Using this estimated ground speed of 181 knots the flight should have arrived abeam of Rennes, 390

⁷Civil Air Regulations, Sec 42.48 (a) *Individual pilot limitations* — "(2) A pilot shall receive 24 hours of rest before being assigned further duty when he has flown in excess of 8 hours during any 24 consecutive hours Time spent in deadhead transportation to or from duty assignment shall not be considered part of such rest period (3) A pilot shall be relieved from all duty for not less than 24 consecutive hours at least once during any 7 consecutive days "

miles from Marseille, at 2029, instead of 2050 as reported Likewise, the celestial fix taken near the French Coast must have been in error for the navigator testified that on the basis of the fix he computed the ground speed to be 138 knots, which obviously was wrong Accordingly, it must be concluded that the flight progressed over its route much faster than was computed or realized by the crew

At 2227 the flight reported over Land's End At this time it had flown four hours and seven minutes from Marseille, and, at the estimated ground speed of 181 knots, would have flown 750 miles from Marseille and been, not over Land's End, but only 15 miles from the southern tip of Ireland It should be realized that as aircraft weight was reduced as fuel was consumed, the air speed increased, unless, of course, throttles were retarded to compensate for the reduction in weight Therefore, it is entirely possible that air speed increased during the four hours and seven minute interval sufficient to allow for the additional travel of 15 miles to the southern tip of Ireland It therefore appears reasonable to conclude that at 2227 the flight was not over Land's End, but over one of the narrow peninsulas of land of southern Ireland, such as Mizen Head

Several statements of the crew support the above conclusion The first officer stated that he had a relative bearing of 215 degrees on Brest approximately 20 minutes after passing the French Coast, and at that time noticed a second coastline ahead The observation of a relative bearing of 215 degrees on Brest within 20 minutes flight time of the French Coast would place the aircraft on a true bearing of 174 degrees drawn through Brest, and at a position south of Land's End Furthermore, it was after the first officer observed the bearing on Brest that the captain asked the navigator if they were not just south of the Cherbourg Peninsula and if the Channel Islands were not off to their right An inspection of the chart, see Appendix I, will show that Land's End could be mistakenly identified as the Cherbourg Peninsula, and that the Channel Islands could be confused with the Round Island group south of Land's End It, therefore, appears that the flight was abeam of Land's End when the crew

believed themselves to be abeam of the Cherbourg Peninsula. This mistake in position is consistent with the error in ground speed. It follows that the most probable track flown was a straight line drawn from Marseille to Mizen Head, Ireland.

No reliable estimate of air speed from the southern tip of Ireland to the turning point, the point where the flight began its return to Shannon, can be made because power was reduced after 0010 and the crew had no recollection of either power settings or air speed. Accordingly, only a general area in which the turn was made can be established. On the basis of fuel consumption which was actually in excess of 200 gallons per hour for the entire period of the flight, it would appear that the air speed could not have been less than 160 knots, taking into full consideration a reduction of power after 0010 as testified to by the crew. With this estimate of minimum air speed and the winds that existed at the time, the flight would have had a ground speed of 152 knots from Mizen Head and would have flown a distance of 324 miles before turning for return to Shannon. Considering winds, the heading of 310 degrees which the crew stated they flew, and a possible steering error for the flight consistently tended to fly left of course, it appears that the most likely track from Mizen Head was approximately 310 degrees magnetic. The turning point, therefore, would be about 324 miles from Mizen Head on a magnetic bearing of 310 degrees, or in the general location of 53 27 degrees north latitude and 18 20 degrees west longitude. (See Chart, Appendix I.)

In summary, it appears that the most probable flight track was from Rome to Marseille, from Marseille to Mizen Head, from Mizen Head to the turning point of 53 27 degrees north latitude and 18 20 degrees west longitude, and from there to the point of ditching.

Though some question may be entertained as to times, locations, and other data pertaining to the flight, there can be little doubt that the flight met with disaster because of inadequate flight planning and haphazard performance of flight duties. During the planning stage of the flight the crew did not confer with one another and they had no agreement nor accurate knowledge of route, fuel hours on board, fuel requirements, or duration of flight. The weather information

obtained was not applicable to the route which was actually flown, and no attempt was made en route to secure this information. Accurate hourly positions of the aircraft were not determined and plotted. Radio facilities, in particular the Shannon radio range, were not used to their best advantage. And, finally, celestial navigation was not used as a means of routine position determination though the stars were visible at all times.

It is apparent from the various errors and omissions of the crew that the captain did not supervise either the flight planning or the flight duties as his responsibilities required. As a result, the aircraft was flown beyond its destination and fuel was exhausted before the return to Shannon could be completed.

FINDINGS

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

- 1 The crew, carrier and aircraft were properly certificated.
- 2 Weather conditions were suitable for flight by visual reference to the ground from Rome, Italy, to Shannon, Ireland.
- 3 All radio facilities were functioning normally during the operation of the flight, however, the radio facilities, in particular the Shannon radio range, were not used to the best advantage.
- 4 No significant maloperation of the aircraft existed during the operation of the flight.
- 5 The crew did not confer during flight planning, and did not have any agreement or accurate knowledge as to route, fuel hours on board, fuel requirements, or duration of flight.
- 6 Weather information which was obtained at the time of flight planning was not obtained for the route which was flown, and no attempt was made en route to secure such information.
- 7 Accurate hourly positions of the aircraft were not determined or plotted, nor was celestial navigation used as a routine means of position determination, though the stars were visible at all times after sunset.
- 8 The flight passed over the immediate vicinity of Mizen Head, Ireland, at 2227 at which time it erroneously reported its

position to Shannon radio as being over Land's End, Great Britain

9 The flight continued beyond destination until approximately 0050, at which time a turn was made in the vicinity of 53 27 degrees north latitude and 18 20 degrees west longitude for return to Shannon

10 All fuel was exhausted at 0240, necessitating a ditching at a point approximately seven miles northwest of Lurga Point on the Irish Coast

—15315

PROBABLE CAUSE

The Board determines that the probable cause of this accident was the failure of the captain to exercise the proper supervision over his crew during flight planning and while en route

BY THE CIVIL AERONAUTICS BOARD

/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 at approximately 2320 Eastern Daylight Time, August 14, 1949. This notice was received by telephone from the CAA Communications station at LaGuardia Field, N Y. After the Chief Aeronautical Officer for the Bureau of Industries and Commerce of Ireland confirmed the notice, an investigator was immediately sent to Shannon where the initial part of the investigation was accomplished. As part of the investigation a public hearing was held in New York, New York, September 13-14, 1949.

AIR CARRIER

Transocean Air Lines is a California Corporation, organized in May of 1946. Its principal place of business is located in Oakland, California, where the company maintains an operation and maintenance base. The company also has operation and maintenance facilities at Bradley Field, Windsor Locks, Connecticut, from which its Atlantic-European Division is operated. The company held a letter of registration issued by the Civil Aeronautics Board and an air carrier operating certificate issued by the Civil Aeronautics Administration.

FLIGHT PERSONNEL

Captain Edward C. Bessey, age 35, was employed by the company September 11, 1946. At the time of the accident he had a total of 8,600 flying hours, of which 2,500 were in DC-4 type aircraft. He held a valid airline transport pilot certificate and a current medical certificate. His last six months' CAA instrument check and aircraft competency check were completed in April 1949.

First Officer Richard Hall, age 29, was employed by the company August 7, 1948. He had previously been trained in the U S Air Forces and had been employed as a pilot for both scheduled and non-scheduled carriers prior to his employment with Transocean Air Lines. He had a total of 6,200 flying hours, of which 2,500 were in DC-4 type aircraft. He held a valid airline transport pilot certificate and a current medical certificate. His last six months' CAA instrument check and aircraft competency check were accomplished in June 1949.

Flight Navigator James A. Baumann, age 30, was employed by the company August 12, 1948. He had received training as a naviga-

tor with the United States Navy, and had approximately 3,100 hours of navigational flight experience, of which 1,500 hours had been accomplished in C-54 aircraft. He held a CAA navigator's certificate which was currently effective, his last physical examination being accomplished August 1, 1949.

Second Officer John W. Moore, age 41, was employed by the company May 10, 1948. He held a valid airline transport pilot certificate and had a total of 10,500 hours of which 1,200 had been accomplished in C-54 equipment. His last six months' instrument and aircraft competency check had been accomplished May 3, 1949, and his last medical examination had been completed March 18, 1949.

Flight Radio Officer Robert D. Thomas, age 26, was employed by the company August 13, 1948. He had a total of 2,374 flying hours, of which 839 were in C-54 type equipment. He held a valid radio-telephone first class certificate and had passed his last physical examination in June 1949.

Flight Radio Officer Herbert Ashbell, age 23, was employed by the company June 30, 1947. He had a total of 3,300 flying hours, 2,300 being in the C-54 equipment. He held a valid radio-telephone certificate, second class.

Flight Stewardess Luigina Cerabona, age 24, was employed by the company July 23, 1949.

Flight Purser Ralph H. Fisher, age 23, was employed by the company June 19, 1949. No ratings or certificates were held by either the purser or stewardess, and none is required.

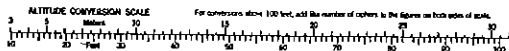
Captain Bessey, First Officer Hall, and Second Officer Moore were not qualified in celestial navigation, although Captain Bessey testified he had received training in celestial navigation.

THE AIRCRAFT

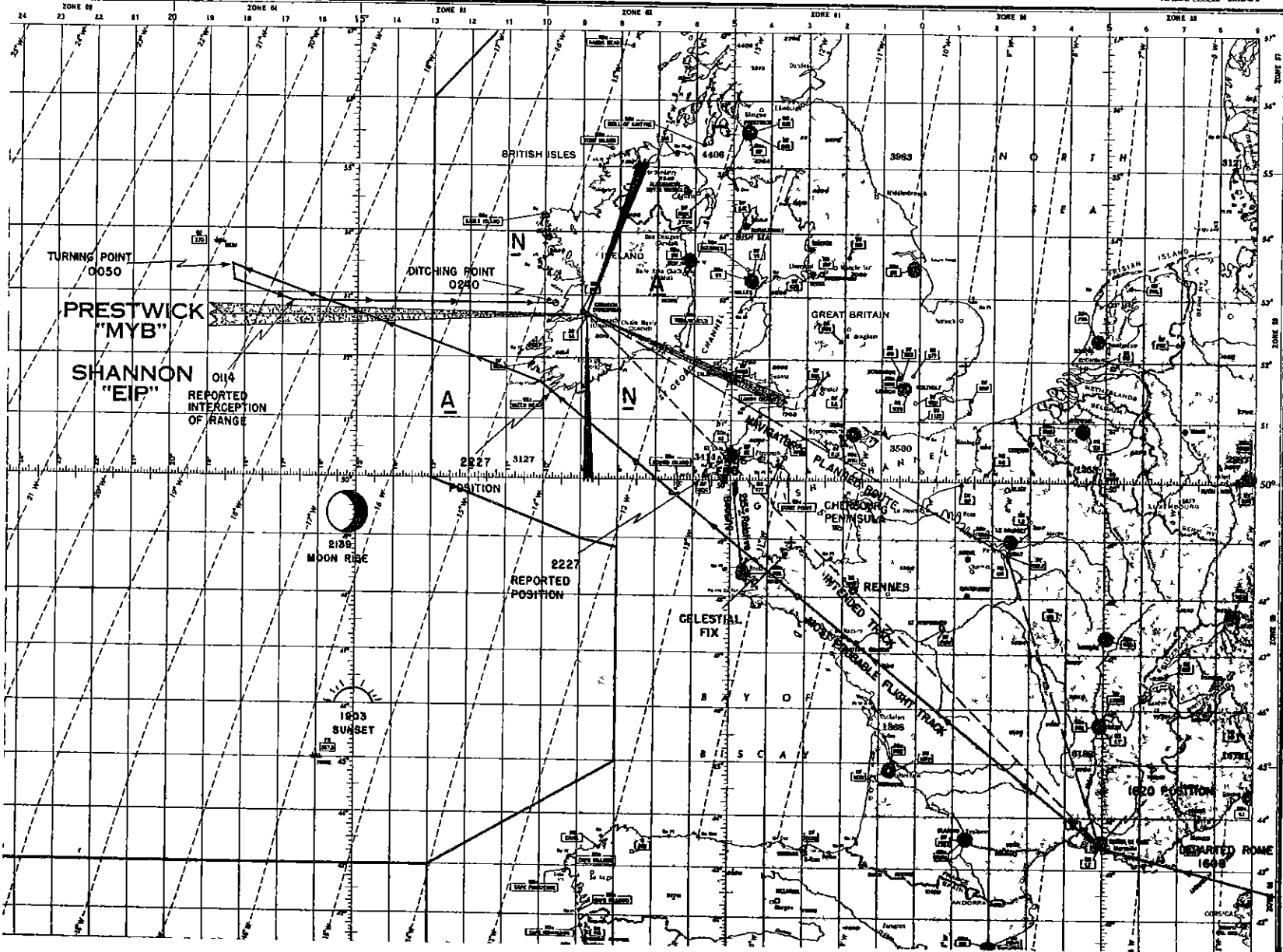
N-79998 was a C-54A-DC aircraft currently certificated by the CAA with manufacturer's serial number 3076. The airplane was equipped with 24 double seats and 2 single seats and had a capacity for 3,326 gallons of fuel. The airplane was equipped with Pratt and Whitney R-2000 engines. Engine time prior to the last flight was No 1 engine 191 hours, No 2 engine 123 hours, No 3 engine 760 hours and No 4 engine 222 hours.

ELEVATIONS IN FEET

AIRCRAFT POSITION CHART



Standard Cylindrical Projection
with poles at 15,00,000 latitude



Appendix I