GOVERNMENT OF AUSTRALIA DEPARTMENT OF TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION SUMMARY REPORT

Publication of this report is authorised by the Secretary under the provisions of Air Navigation Regulations 283 (1)

Reference No: AS/753/1020

1 LOCATION OF OCCURRENCE

	Height a.m.s.l	Date	Time (Local)	Zone
Near Cape Paterson, Victoria	Sea Level	10.5.75	0218 hours	EST

THE AIRCRAFT

Make and Model	Registration
Bristol 170 MK 21/A1	VH-SJQ

3. CONCLUSIONS

3.1 At approximately 0218 hours Eastern Standard Time on 10 May 1975, Bristol 170 Mark 21/A1 aircraft registered VH-SJQ, entered the sea near Cape Paterson, Victoria. The probable position is Latitude 38° 41' South, Longitude 145° 32' East.

3.2 The operator of the aircraft, and the holder of the certificate of registration, was At the time of the accident, the aircraft was engaged on a charter flight from Essendon Airport, Melbourne, to Launceston.

3.3 The aircraft was approved for flight under the Instrument Flight Rules (IFR), and there was a current certificate of airworthiness. A maintenance release had been issued on 21 March 1975, and there is no evidence that, at the commencement of the flight, the aircraft was in other than an airworthy condition. VH-SJQ had flown a total of 9526:58 hours; the port engine had completed 704:15 hours since overhaul, and the starboard engine had completed 1540:57 hours since overhaul.

3.4 VH-SJQ was approved for operation by a minimum crew of one pilot, subject to the carriage of an additional flight crew member who was the holder of a flight radio telephone licence.

3.5 On board the aircraft were the pilot, , and the radio operator, The body of the radio operator was recovered from the sea; post mortem examination revealed no fatal injuries, and that death was due to drowning. No evidence was found of carbon monoxide or alcohol. The body of the pilot has not been recovered.

3.6 The pilot, aged years, held a current senior commercial pilot licence endorsed for the aircraft type and a first class instrument rating. His total flying experience was 18 821 hours of which 264 hours had been gained in Bristol 170 aircraft - 188 of these hours had been flown in the Mark 21 model of the Bristol 170 type.

3.7 The radio operator, aged years, was the holder of a current radio telephone licence and he had flown 35 hours as a radio operator in Bristol 170 aircraft, all under the command of In addition, he held a current private pilot licence, his total flying experience, as a pilot, being 88 hours on light aircraft.

3.8 The aircraft was last weighed on 29 April 1975, at which time the basic weight was determined to be 12 279 kg. The records indicate that, during this flight, it was carrying 4200 kg of mixed freight which had been subjected to two independent weighings and which, prior to loading, had been segregated into compartment loads. When placed in the aircraft this freight filled an estimated 90 per cent of the aircraft volumetric capacity. No evidence was found that the freight had been jettisoned during the final minutes of the flight.

3.9 At about 2040 hours on 9 May 1975 it was arranged that the aircraft be refuelled to a total of 2275 litres. Immediately prior to the flight the radio operator was observed to 'dip' the fuel tanks and, subsequently, a fuel quantity of 2252 litres was recorded on the aircraft loading documentation. A sample of fuel from the tanker from which the aircraft was refuelled was found to be uncontaminated, and of the correct grade for the aircraft.

3.10 The documentation prepared for the departure of the aircraft indicated that the gross weight was 18 055 kg. The maximum permissible gross weight for take-off was 18 160 kg. It is probable that the actual gross weight at the time of engine start was 18 071 kg, and that the centre of gravity throughout the flight was within the specified limits. It is calculated that the gross weight at the time the port engine was subsequently shut down was about 17 690 kg and, at the time of the accident about 17 429 kg.

3.11 Prior to the commencement of the flight the pilot compiled and submitted a flight plan which covered the proposed flight from Essendon Airport to Launceston and Hobart. This indicated that the flight category

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was IFR; that the route to be flown to Launceston was via the reporting points designated Cowes, Westgate, West Bass and Devonport; and that the planned cruising altitude was 3500 feet. The estimated time interval was 112 minutes, and the total fuel endurance was 500 minutes.

3.12 The forecast, provided to the pilot prior to his departure, predicted that the en route meteorological conditions for the Victorian coast and Bass Strait segments of the flight would be scattered stratus cloud based at 1000 feet with tops at 2000 feet, scattered cumulus cloud based at 3000 feet with tops at 10 000 feet, moderate turbulence in the cumulus cloud; and the freezing level would be 7000 feet decreasing to 5000 feet in the vicinity of Tasmania. The visibility at sea level was predicted to be 40 kilometres reducing to 8 kilometres in rain showers and 500 metres in fog. The forecast did not contain a prediction of the wind velocity at 3500 feet, but that predicted for 5000 feet was from 260 degrees (True) at a speed of 30 knots.

3.13 The flight departed from Essendon Airport at 0500 hours. At 0122 hours the flight reported to the Melbourne Flight Service Unit (FSU) that it was then at the Westgate reporting point cruising at 3500 feet, and its estimated time of arrival at the West Bass reporting point was 0159 hours.

3.14 At 0145:44 hours VH-SJQ advised the Melbourne FSU 'we have an engine failure on the port side, we have it feathered and are returning to Melbourne'. In response to a request from the FSU the flight advised it was able to maintain height 'at the moment'. At 0148:54 VH-SJQ confirmed that 'the port engine has failed and is feathered' and shortly thereafter advised an estimated time of arrival at the Primegate reporting point en route to Essendon Airport. The Uncertainty Phase of the search and rescue procedures was declared by the Melbourne Air Traffic Control Unit (ATC).

3.15 At 0151:58 hours the flight advised the Melbourne FSU 'we are making a slow descent to one five zero zero' and, in answer to a query, reported 'we're unable to maintain our height with our rated power'. The Alert Phase of the search and rescue procedures was declared by Melbourne ATC, and a Bristol 170 Mark 31 aircraft en route from Launceston to Essendon Airport was diverted to intercept VH-SJQ and act as an escort. At 0157:46 hours VH-SJQ reported 'four eight DME Wonthaggi', and shortly thereafter, reported 'tracking one eight three on the Wonthaggi VOR'.

3.16 At 0203:00 hours VH-SJQ transmitted a distress call and reported 'we're passed fifteen hundred feet and still going down'. The position of the aircraft at 0203:57 hours was reported as 'on the one eight six radial Wonthaggi and we are three seven DME'. The Distress Phase of the search and rescue procedures was declared by Melbourne ATC and a second northbound aircraft was diverted to intercept VH-SJQ.

3.17 At 0204:32 hours VH-SJQ reported 'we're down to nine hundred feet at the moment'; at 0207:42 hours, 'at six hundred feet at the moment; at 0212:55 hours, 'two two DME'; at 0213:22 hours, altitude was 300 feet; 0214:31 hours, 'we're down to one hundred feet'; and, at 0215:23 hours, 'this is a final MAYDAY call, we are approximately one eight DME and our altimeters registering zero feet'. Melbourne FSU then transmitted a ditching report of moderate seas with a moderate south-westerly swell; this was acknowledged by VH-SJQ. The escort aircraft then heard further transmissions from VH-SJQ which indicated that both altimeters were reading zero; the crew could see the tops of waves; and DME distances of 16, 15 and 14 were transmitted, the latter being the last transmission heard from the aircraft the time being about 0218 hours. Neither of the escort aircraft sighted VH-SJQ.

3.18 Post analysis of the meteorological information indicates that the weather in the area of the accident was: surface wind from 280 degrees (True) at 15 knots, scattered cumulus cloud base 2500 feet, scattered stratus cloud base 1200 feet, patches of sea fog, visibility 40 kilometres reducing to 4000 metres in rainshowers, temperature 12 degrees Celsius. It is probable that the temperatures at 1500 feet, 2500 feet, and 3500 feet were 9.5 degrees, 7 degrees and 5 degrees Celsius respectively. The conditions were not conducive to the formation of airframe or carburettor icing, and search aircraft in the area did not encounter any such icing.

3.19 Air, sea and beach searches were carried out: the air and sea searches were discontinued at nightfall on 11 May 1975, and the beach search 48 hours later. The first sighting of wreckage was made at 0945 hours on 10 May 1975, and some two hours later a vessel recovered the body of the radio operator from the sea south-east of Cape Paterson. The life jacket on the body was punctured and another uninflated life jacket was found floating nearby. The rubber dinghy which had been carried in VH-SJQ was found, inflated, in the sea some 8 kilometres downwind from the body of the radio operator; it was not a type approved for carriage in Australian aircraft. Sections of the wooden flooring from VH-SJQ together with items of the

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freight, weighing some 100 kilograms, were found floating in the vicinity of Cape Paterson.

3.20 On 16 May 1975 a broad-sweep underwater sonar search of the area was undertaken by a naval vessel but this failed to locate the aircraft. During the period 25 September to 2 October 1975 a detailed underwater sonar search in association with a team of divers, was undertaken by a naval vessel. The fuselage section aft of the rear cargo door, but not including the rudder and fin, was located in some 40 metres of water 4.6 kilometres south east of Cape Paterson. Attempts to raise it for detailed examination were not successful. The search was resumed over the period 10-12 October 1975 but no other aircraft wreckage was located.

3.21 Subsequent to this accident, flight tests were carried out in a Bristol 170 Mark 21/A1 aircraft similar to VH-SJQ. These tests indicated that the asymmetric climb performance of the test aircraft at the maximum permissible gross weight of 18 160 kg, using maximum permissible continuous en route power at an altitude of 5000 feet under standard atmospheric conditions, was 51 ft/min; and that this performance was not significantly affected by variations of up to 5 knots either side of the optimum indicated airspeed of 96 knots.

3.22 Analysis of the information available indicates that the flight profile flown by VH-SJQ is compatible with the aircraft having been flown at an indicated airspeed of 95 knots, and a power output from the starboard engine of 1250 BHP, i.e. 26 per cent less than the normal maximum power available in the conditions which prevailed.

3.23 The pilot did not indicate in detail the nature of the difficulties he was experiencing, and as the majority of the aircraft wreckage has not been found it has not been possible to determine why he shut down the port engine; whether or not there was a degradation in the power output of the starboard engine; or whether there was some other factor which might have affected the performance of the aircraft. It might be significant, however, that at 0208:33 hours when a crew inter-communication was inadvertently transmitted from VH-SJQ, it was stated 'cylinder head is about three forty, oil pressure is around about eighty, oil temperature is about ah sixty five'. Such an oil pressure and temperature is normal, but the reported cylinder head temperature is 30 degrees Celsius in excess of the permissible emergency maximum.

OPINION AS TO CAUSE

The cause of the accident has not been determined.

Approved for publication	(I. M. Leslie) Delegate of the Secretary	Date 12.11.1976

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