No: 12/85 **Ref: EW/C936**

Aircraft type and registration:	Rockwell Commander 112 G-BHOC (light single engined fixed wing aircraft)
Year of Manufacture:	1975
Date and time (GMT):	1 October 1985 at 1958 hrs
Location:	Little Stretton, Leicestershire
Type of flight:	Private, training
Persons on board:	Crew — 1 Passengers — None
Injuries:	Crew — 1 (fatal) Passengers — N/A
Nature of damage:	Aircraft destroyed, two wires of 32000 v electricity grid damaged
Commander's Licence:	Private Pilot's Licence with IMC and Night Ratings
Commander's Age:	48 years
Commander's Total Flying Experience:	404 hours (of which 155 were on type and 11 at night)
Information Source:	AIB field investigation.

The pilot was flying a detail of solo night circuits at Leicester Airport. He had not flown for over 6 months and this detail would have renewed the privileges of his night rating.

Runway 28 was in use, equipped with runway edge lights and a low intensity, 2 colour approach slope indicator (LITAS) but no approach lighting. The weather was dry and other pilots reported a haze layer at the circuit height of 1000 ft. The surface wind was southerly at 8 kt increasing to 240° 15—20 kt at 2000 ft.

The Rockwell Commander was the only aircraft in the circuit at the time. The first circuit had been uneventful except that the pilot was seen to make an "S" turn on final approach in order to line up with the runway and come to a full stop after the landing, although he had originally declared his intention of carrying out a touch and go. He taxied back to the threshold before commencing another take-off. The aerodrome flight information and safety officer (AFISO) watched the second circuit until the point where the pilot called "downwind" when the AFISO's attention was taken by other duties. Some minutes later the AFISO looked out in the direction of the final approach to Runway 28 expecting to see "OC" on finals when a bright flash was seen to the south east of the airfield. After an aerial and ground search, the wreckage of the aircraft was found 2000 yards to the south east of the runway threshold. The aircraft had flown through 32000 volt electricity power lines, severing one and damaging another, before hitting the ground.

A scale model was constructed to examine the relationship between the damaged electricity cables and the marks made by the cables on the airframe. The aircraft's flight path immediately prior to contact with the cables had been on a heading of 330° magnetic towards the airfield, with a glide slope of between 0° and 10° and roll attitude of less than 10°.

Examination of the ground marks made by the propeller and airframe indicated that the impact had been at an aircraft attitude of about 35° nosedown and at speed of almost 70 kt. The aircraft had been under power, with the landing gear extended and the flaps set to beyond 25°: the Emergency Gear Extension Valve was found in the normal position. The subsequent examination failed to reveal any failure or defect that could not be attributed to the cable or ground impact except a fault associated with one micro-switch on the right main landing gear. Analysis of the filaments of the individual (green) gear position indicator lights showed that at the ground impact the bulbs for the nose and left gear legs were lit but that the bulb for the right leg was unlit. Each light is controlled by two micro-switches connected in series; one switch is mounted against the drag brace to indicate a positive geometric down lock, the other against the spring-loaded locking-pin on the hydraulic actuator. Examination of this actuator showed that with the right gear locked down the operation of the second micro-switch was intermittent. The landing gear warning system was designed so that a bell would sound with any down lock micro-switch open and either the flaps selected beyond the 25° position or the throttle reduced below approximately 14 inches Hg of manifold pressure. G-BHOC carried the constructor's number 378. On aircraft from 381 onwards the actuator locking-pin and the associated micro-switch were deleted.

Examination of the pilot's restraint system showed that while there was evidence of high loading on the lap strap portion of the harness, there was no evidence that the upper torso restraint had been attached at the time of impact.

It was not possible to establish the path of the aircraft from the point where the pilot called "downwind" to the point where he crossed the down wind leg heading 330° towards the airfield, nor could a reason be found to account for his descent from the circuit height of 1000 feet.

The engineering evidence suggests that the pilot had an 'unsafe' indication from his right landing gear. The emergency procedures section of the aircraft's flight manual recommend that in the event of a landing gear extension malfunction, the pilot should check the light using press-to-test facility and then re-cycle the landing gear before trying the manual gear extension systems. It advises that positive indication of gear extension is given by the illumination of the green gear down lights and an absence of the red gear warning light, or of the warning bell if the flaps are selected beyond the 25° point.

In a test flight with an identical aircraft it was found that if power was set to maintain a circuit speed of around 85 to 90 kt and the landing gear was then lowered and the flaps selected to 25°, the aircraft remained in trimmed flight at that speed but with a rate of descent of about 500 feet per minute.