AAIB Bulletin No: 2/94 **Ref: EW/G93/12/01** **Category: 1.2**

Aircraft Type and Registration:	Beech 58 Baron, G-BTFT
No & Type of Engines:	2 Continental IO-520-CB piston engines
Year of Manufacture:	1979
Date & Time (UTC):	1 December 1993 at 1643 hrs
Location:	Blackbushe Airport, Surrey
Type of Flight:	Private
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Nose landing gear doors, right main landing gear door, underside of nose, both propellers, engines requiring shock load inspection
Commander's Licence:	Private Pilot's Licence with IMC and Night Ratings
Commander's Age:	44 years
Commander's Flying Experience:	353 hours (of which 29 were on type) Last 90 days - 5 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot; post salvage examination of aircraft by AAIB Engineering Inspector

The aircraft was carring out night continuation flying training with the pilot accompanied by a flying instructor. During one touch-and-go landing, the pilot omitted to raise the flaps before taking the aircraft back into the air. Accordingly, he made particular efforts on the following circuit to ensure that he did not repeat the omission. Unfortunately, on that occasion, whilst still on the ground, he moved the landing gear selector instead of that for the flaps.

The instructor immediately over-rode the selection, ensured full power was applied and took control to ensure the aircraft was airborne. He noted that the landing gear unlocked light illuminated briefly as he over-rode the selection, after which the nosewheel and left main gear indications were seen to be green and the right main gear indicator was not illuminated. The instructor assessed that the props were undamaged and the aircraft handling remained normal.

The aircraft was then flown away from the circuit and the gear re-cycled at a low airspeed. The indications were now green on both main gears but no illumination was present on the nose gear indicator. The crew therefore re-cycled the gear, with minimum airspeed, producing the same result. The emergency lowering drill using the manual hand-crank system was then utilised. This produced the desired three green indications so the aircraft was returned to the circuit and a stable approach was made at V_{REF} followed by a gentle touchdown carried out at V_{REF} - 10 kt.

After the landing, the nosewheel was held off until elevator authority was lost, at which point the nosewheel touched the runway and promptly collapsed. The instructor selected ICO on both engines whilst the pilot switched off the fuel and the electrical system. The aircraft came to a halt on the runway, was made safe and the occupants evacuated through the normal exit.

Initial examination of the aircraft revealed that it had sustained damage to the right main landing-gear door consistant with having contacted the runway whilst the gear was in transit. A more complete examination, after salvage and progressive removal of access panels, revealed that the push-pull rod operating the nose leg was bent, as was the curved quadrant on the inboard end of the operating rod for the right main gear, close to the point where it joins the operating bellcrank.

Examination of the mechanism confirmed that, in normal electrical operation, gear-lowering motion is stopped by the closing of a microswitch, but operation of the emergency system enables the input shaft of the operating gearbox to be revolved approximately an additional half turn, thus driving the landing gear push rods slightly further in the gear-lowering direction. An examination of the layout of the nose gear operating and indicating mechanism showed that the microswitch signalling the 'green' indication is mounted remotely from the geometric lock and is operated by transmitting motion from a part of the operating mechanism at the forward end of the operating rod, through a lever system. The geometry is such that considerable movement of the mechanism is transferred into a very small movement at the microswitch.