AAIB Bulletin No: 4/2005 **Ref: EW/G2005/01/03** **Category: 1.3**

INCIDENT

Aircraft Type and Registration:	Piper PA-24-260 Comanche, G-BRXW	
No & Type of Engines:	1 Lycoming O-540-E4A5 piston engine	
Year of Manufacture:	1964	
Date & Time (UTC):	13 January 2005 at 1623 hrs	
Location:	Coventry Airport, West Midlands	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to underside of fuselage, landing gear and propeller; possibly beyond economic repair	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	72 years	
Commander's Flying Experience:	181 hours (all on type) Last 90 days - 4 hours Last 28 days - 0 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone enquiries by AAIB	

Having flown to Leicester earlier in the day without problems, the pilot was returning to Coventry. However, when he selected the landing gear DOWN on the approach the gear appeared to stop when only about half-extended. He noticed that the landing gear motor circuit breaker had tripped but each time he tried to reset it, it tripped again. A fly-by of the control tower resulted in the information being passed to him that "The nose gear appears to be not in the locked-down condition".

The pilot then flew to the nearby Visual Reference Point (VRP) at Draycot Water with the intention of deploying the manual 'free-fall' mechanism but this was also unsuccessful. He then spoke with his usual engineer on the radio, but he was unable to offer any further advice. Having exhausted all his options he orbited the VRP for about 50 minutes to burn-off fuel and to allow the glare from the low sun to reduce. He then positioned the aircraft for an approach to Coventry Airport, where ATC had suggested that he land on the grass section of the northern taxiway. The pilot made an approach with

full flap selected and with some power applied, upon touchdown all three landing gears collapsed and the aircraft slid to a halt. He and his passenger evacuated the aircraft normally without injury, there was no fire and no apparent fuel leaks.

Examination of the Aircraft

The PA-24 aircraft uses a single electric motor to drive all three landing gears. This is connected to a transmission which converts the rotary motion into a linear movement which acts upon two large push-pull 'Bowden' type cables to move the main landing gears, and a rod which moves the nose landing gear. In the event of electrical malfunction of the landing gear, a manual release lever is provided which should disconnect the transmission from the motor, allowing the landing gear to drop under gravity.

It was found that the landing gear motor relay had developed an internal short-circuit and that this was the reason why the circuit breaker had tripped and the electric motor had stopped. There had been considerable damage to the actuating system due to the landing loads being fed-back into the operating system and it was not possible to operate the manual release mechanism. However, the maintenance company is of the opinion that, given the unusual semi-extended condition of the landing gear, it may have resulted in forces which rendered it difficult, if not impossible, to achieve the mechanical release necessary for free-fall.

The circumstances of this accident are similar to those which occurred to another PA-24 aircraft, G-BUTL on 15 October 1998, and which are reported in AAIB Bulletin 5/99. As in the case of G-BRXW, the pilot selected landing gear DOWN normally, but the motor circuit-breaker tripped, leaving the gear partially extended. Subsequent operation of the free-fall lever was also unsuccessful in completely lowering the gear.

The investigation of that accident suggested that a restriction in one of the main landing gear operating cables may have been responsible for high forces which stalled the motor and also prevented the gear from free-falling. However, it is not known whether the motor relay was checked at the time, although the motor itself was found to be serviceable.