AAIB Bulletin No: 2/94 **Ref: EW/G93/09/15** **Category: 1.3**

Aircraft Type and Registration:	Reims Cessna FRA150L Aerobat, G-BCRN
No & Type of Engines:	1 Continental O-240-A piston engine
Year of Manufacture:	1974
Date & Time (UTC):	25 September 1993 at 1222 hrs
Location:	Aberdeen Airport
Type of Flight:	Private (Training)
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - Minor Passengers - N/A
Nature of Damage:	Substantial damage to the entire aircraft which came to rest inverted
Commander's Licence:	Student Pilot
Commander's Age:	40 years
Commander's Flying Experience:	65 hours (all on type) Last 90 days - 40 hours Last 28 days - 0 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, AAIB inquiries and R/T recordings

The accident occurred when the aircraft was landing on Runway 34 at Aberdeen Airport following a cross-country navigation flight from Perth. Weather conditions at the time were fine with unlimited visibility, scattered cloud base 3,000 feet, and a surface wind of 080°/05 kt. Due to the circumstances of this accident, R/T and radar recordings were impounded and a separate ATC investigation was conducted by the ATC Investigation section of the Safety Regulation Group of the CAA.

The cross-country flight from Perth was uneventful and, at 1214 hrs, G-BCRN made an initial call on the Aberdeen Airport Control frequency of 118.100 MHz. The aerodrome controller at this time was a trainee who was being monitored by an experienced instructor. The pilot was instructed by the tower controller to report at the Bridge of Don, a Visual Reporting Point (VRP) 10 nm to the east south east of the airport. At 1217 hrs a Boeing 737 aircraft established communication and reported inbound on the ILS for Runway 34. The controller instructed this aircraft to report at the outer marker and subsequently cleared it to land. At 1219.30 hrs the Cessna pilot reported his position over the Bridge of Don VRP and the pilot was instructed to join the visual pattern on right base for Runway 34.

The pilot reports that he was given clearance to join right base for Runway 34, number two behind a 'Speedbird aircraft'. He turned onto final approach, made his radio call and was cleared to land. The aircraft touched down close to the centreline and shortly afterwards started veering hard to the left. The pilot was unable to correct the situation before the aircraft ran onto the soft ground alongside the runway, when the nose landing gear dug in and the aircraft turned over and came to rest inverted. There was no fire and he made the switches safe and before releasing himself from the aircraft. The full restraint harness held him securely during the accident sequence and his only injuries were slight grazing and bruising to his shins as they struck the bottom of the instrument panel as the aircraft turned over. Personnel of the Airport Fire Service had observed the accident and fire and rescue vehicles were quickly at the scene.

When the Cessna reported over the Bridge of Don, the controller cleared the aircraft to proceed for right base for Runway 34 but did not advise the pilot of the recommended spacing for vortex wake purposes from the aircraft in front. In such circumstances the Manual of Air Traffic Services Part I requires that the pilot of an aircraft in the 'light' vortex wake category (such as the Cessna) should be advised by ATC that a minimum of 6 nm behind a 'medium' category aircraft (such as a Boeing 737) should be achieved in order to avoid the preceding aircraft's wake turbulence. Where the following aircraft is operating under VFR, the responsibility to avoid wake turbulence rests with the pilot and details of the phenomenon together with techniques to be adopted for its avoidance are published in the UK Aeronautical Information Circular (AIC) 178/93. This document, as well as giving separation minima distances, also gives a time equivalent and states that the six mile lateral separation equates to a time interval of three minutes. The radar recording of these flights, albeit of poor quality, show that the Cessna closed to within some 2.8 nm of the Boeing 737 before the radar returns fade. RTF recordings indicate that the Cessna landed just over two and a half minutes after the Boeing 737 had landed and cleared the runway.

Given the transient nature of turbulent wake its contribution to the circumstances of this accident could not be assessed. For similar reasons the possibility of further turbulence caused by the disturbed air created by the deployment of the Boeing 737's thrust reversers cannot be discounted.