

**Aviation Safety Investigation Report
199402866**

**Boeing Co
B737**

03 October 1994

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number:	199402866	Occurrence Type:	Incident
Location:	32km SSE Canberra		
State:	ACT	Inv Category:	4
Date:	Monday 03 October 1994		
Time:	1825 hours	Time Zone	EST
Highest Injury Level:	None		
Aircraft Manufacturer:	Boeing Co		
Aircraft Model:	737-377		
Aircraft Registration:	VH-CZO	Serial Number:	24304
Type of Operation:	Air Transport Domestic High Capacity Passenger Scheduled		
Damage to Aircraft:	Nil		
Departure Point:	Sydney NSW		
Departure Time:			
Destination:	Canberra ACT		

Approved for Release: Wednesday, September 4, 1996

The aircraft was being vectored for an intercept of the runway 35 localiser at Canberra airport. While flying the 160 degree radial, 17 nautical miles from Canberra, on a heading of 310 degrees at 6,000 feet, a false capture of the localiser occurred. The crew identified the false capture, reselected the heading mode and held that mode until positively established on the localiser. The approach and landing was completed without further incident.

The investigation found that the problem was not new and had been known for a number of years, although very few formal reports had been raised. The domestic operators had issued notices to their Boeing 737 crews advising details of the problem. The operators required that any further occurrences were to be reported to air traffic control, followed up by a formal air safety incident report. The Civil Aviation Safety Authority issued a NOTAM containing similar advice and requirements.

In March 1995 the Bureau's data base was modified to specifically record false localiser captures. In the 18 month period to August 1996 the data base captured 17 events that had affected all the major types of high capacity regular public transport aircraft on the Australian registry. While the majority were reported on approaches to Sydney airport, false captures were also reported at Canberra, Wellington and Christchurch airports.

False capture results in many different indications depending on the type of aircraft, the equipment fitted, and the mode selected on the autopilot or flight director. With certain modes selected an aircraft can deviate from the desired track and follow the false signal.

Research has shown that this phenomena has been recognised overseas and some work has been carried out in an effort to identify the causal factors.

One group believes that the false capture occurs due to significant scalloping, or signal reversals, in the region of the localiser where the signal is normally saturated. Testing of transmitters at Australian airports by the Civil Aviation Safety Authority has shown that the radiated signals meet the International Civil Aviation Organisations requirements for signal propagation.

Another organisation suggested that the capture criterion for some flight management systems and the algorithm for some digital receivers make invalid assumptions about the localiser signal.

Due to the lack of substantive data the Bureau's Safety Programs group has initiated a research project aimed at identifying the extent of the problem, quantifying its effect and making recommendations as necessary. The results of the project will be published in due course.

