

**Aviation Safety Investigation Report
198902608**

**Boeing 747-238
Piper PA28-151**

8 January 1989

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Prior to boarding the aircraft the pilot's flight plan was checked by an instructor but formal briefing on the particular navigation exercise or the LOE was not provided. The procedure in place at the relevant flying organisation relied on the student to find an available instructor to provide flight plan checking and exercise briefings. No self-briefing aid eg video was available at the Bankstown Pilot Briefing Office for pilots to familiarise themselves with the features of the LOE. The PA28 pilot stated that after take-off on Runway 29 Centre at Bankstown the aircraft was climbed straight ahead to 1000 feet before commencing a right turn. The pilot then identified the Rosehill refinery and the first ground strobe light. The aircraft was then on a heading of about 013 degrees magnetic from Bankstown. After passing over the first ground strobe light the pilot was unable to find the next strobe light at Carlingford. Attempts to find the second light were made without reference to the aircraft heading and the pilot then became directionally disoriented. The position of the Carlingford light was correctly depicted on the current Visual Terminal Chart being used by the pilot. Eyewitness evidence indicates that the Carlingford strobe light was operating. The PA28 was flown on headings well to the right of that required to maintain correct track from the first ground strobe light to the second one. This led to a penetration of the Sydney CTR and conflict with the inbound B747. Sydney Approach (North) was not able to detect the impending conflict as the PA28 was not transponding. It was not required to have an active transponder and there were no primary radar returns which was probably due to tangential fading. The PA28 was not displayed until the B747 and the PA28 were in close proximity and the PA28 changed heading. Sydney Approach Control (North) is not able to identify monitor or readily communicate directly with aircraft which stray into the Sydney CTR from the LOE. The rotating beacon of the PA28 was ineffective in giving the B747 crew early warning of conflicting traffic. The PA28 was sighted against a background of suburban housing presenting a nearly head-on aspect. None of the B747 crew recalled observing the PA28's rotating beacon. The B747 crew considered that the PA28 was sighted in sufficient time for avoiding action to have been taken had it have been warranted. Neither aircraft took avoiding action. The performance of the Sydney air traffic control radar was not a factor.

Significant Factors:

The following factors were considered relevant to the development of the incident

1. There are no facilities in place by which Sydney Air Traffic Controllers (ATC) can effectively monitor all traffic in the LOE identify aircraft which enter the Sydney CTR; communicate direct with aircraft which penetrate.
2. The existing aeronautical ground strobe lights do not provide pilots with adequate guidance.
3. There is no (video tape) self-briefing aid for pilots to study prior to flying through the LOE.
4. The flying organisation's supervision of pilots undertaking navigation training was deficient in that no instructor was directly responsible for ensuring the pilot was competent to carryout the solo navigational exercise and the pilot was not properly briefed for the particular exercise.
5. The pilot lacked familiarity and recency with the Bankstown LOE.
6. The pilot employed inadequate navigational techniques.
7. The rotating beacon on the PA28 was ineffective in assisting visual acquisition in daylight conditions. The following findings were revealed in the course of the investigation. They were not relevant to this particular incident but had the potential to contribute to similar incidents.

1. The current Sydney Visual Terminal Chart dated 15 December 1988 did not accurately depict the location of most of the aeronautical ground strobe lights in the LOE. Successive issues of the Chart have continued to display these and other significant inaccuracies.
2. On 3 November 1988 a Notam was issued advising that the strobe light at Dural was unserviceable. It was still unserviceable at the time of this incident.
3. Sydney ATC cannot readily differentiate between radar returns from aircraft legitimately operating in Restricted Areas R409 A & B (helicopters and floatplanes) and returns from aircraft involved in unauthorised penetration of the Sydney CTR and CTA.

Reccomendations:

For CAA Central and NSW Offices. Consideration should be given to the following

- a. Establishment of facilities whereby ATC can identify monitor and communicate directly with all aircraft which enter the Sydney CTR and CTA from the Bankstown LOE without authorisation.
- b. Revising the inbound and outbound tracks in the LOE so as to minimise the risk of traffic penetrating the Sydney CTR and CTA.
- c. Installing a more effective visual guidance system in the Bankstown LOE than the present aeronautical ground strobe light facilities.
- d. Amending the Sydney VTC so as to accurately show the relative positions of aeronautical ground lights and other significant land marks.
- e. Ensuring that all unserviceable aeronautical ground lights are repaired within hours of the notification of failure.
- f. Establishing a procedure which enables Sydney ATC to identify aircraft intentionally operating in R409 A&B.
- g. Providing self-briefing facilities at the Bankstown pilot briefing office as a matter of urgency for pilots to study prior to operations through the LOE.
- h. Considers a requirement for all Australian registered general aviation aircraft to be fitted with multiple rapid flashing omnidirectional white strobe lights.
- i. Taking action to ensure that pilots undergoing navigation training are properly supervised and maintain a satisfactory level of proficiency in negotiating the Bankstown LOE.