

**INCIDENT**

<b>Aircraft Type and Registration:</b>	Piper PA-28-161 Cherokee Warrior II, G-BXAB	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-320-D3G piston engine	
<b>Year of Manufacture:</b>	1984	
<b>Date &amp; Time (UTC):</b>	16 October 2005 at 0939 hrs	
<b>Location:</b>	Manston Airport, Kent	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - None
<b>Injuries:</b>	Crew - None	Passengers - N/A
<b>Nature of Damage:</b>	Damage to both main landing gear spats; dents and skin punctures to left wing	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	49 years	
<b>Commander's Flying Experience:</b>	220 hours (of which 40 were on type) Last 90 days - 19 hours Last 28 days - 6 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot plus reports from ATC and the airport operator	

**Synopsis**

On its return to Manston Airport at the end of a local flight, the aircraft made an approach to Runway 10, which was operating with a displaced threshold due to survey work related to a temporary PAPI installation. The aircraft touched down short of the displaced threshold and collided with a theodolite, damaging the left wing and left main wheel spat and causing survey personnel to run to safety. There were no injuries and the aircraft taxied clear of the runway without further incident. Damage to the right main wheel spat was caused by a separate impact with a runway guard light. The pilot was aware of the displaced threshold; it was

marked in accordance with relevant regulations and promulgated by NOTAM<sup>1</sup>.

**History of flight**

During the approach, ATC made several references to the existence of a displaced threshold which the pilot acknowledged. Nevertheless, the ATCO in the aerodrome control room judged that the aircraft would

**Footnote**

<sup>1</sup> Notice to Airmen – the normal method of disseminating information to pilots concerning the establishment, condition or change in an aeronautical facility, service, procedure or hazard.

land short of the displaced threshold and warned the pilot about it once again. He then observed the aircraft fly level at a height of approximately 30 ft, drop suddenly with a markedly nose-up attitude, and touch down before the displaced threshold. Personnel involved with the survey saw the aircraft approaching and were able to run clear. They reported that the aircraft touched down approximately 10 to 12 m left of the runway centreline and swerved towards the left hand edge of the marked runway, (30 m from the centreline), where it struck a tripod and theodolite. The aircraft then turned sharply back to the active runway and taxied to the flying school, where it parked and shut down. The pilot reported to ATC that the aircraft had landed short of the displaced threshold but did not mention having struck any objects on the ground.

In her statement to the AAIB, the pilot reported that she was aware of the displaced threshold, but that, during the approach, she allowed the aircraft to become slow, causing it to touch down earlier than intended. She commented that it was not until arriving at the flying school that she was advised that the aircraft had collided with a theodolite.

#### **Damage to aircraft**

The aircraft was inspected by engineering personnel on behalf of the flying school as soon as it became apparent that it had hit something. The inspection revealed damage to the left main landing gear spat, three small impact marks on the left wing leading edge forward of the left main landing gear, a skin puncture on the top surface of the left wing at approximately mid chord and a circular skin puncture on the lower surface of the left wing. The right main landing gear spat was also damaged.

Following an assessment of the damage, temporary skin repairs were effected using adhesive metallic tape. The

aircraft was determined to be otherwise serviceable and flew again that afternoon. Permanent repairs were made subsequently with reference to the aircraft maintenance manual.

#### **Other damage**

Inspection of the manoeuvring areas used by the aircraft revealed damage to a runway guard light at holding point E2, 80 m north of the marked runway edge. A piece of glass reinforced plastic matching the damaged right main gear spat was found within the light unit.

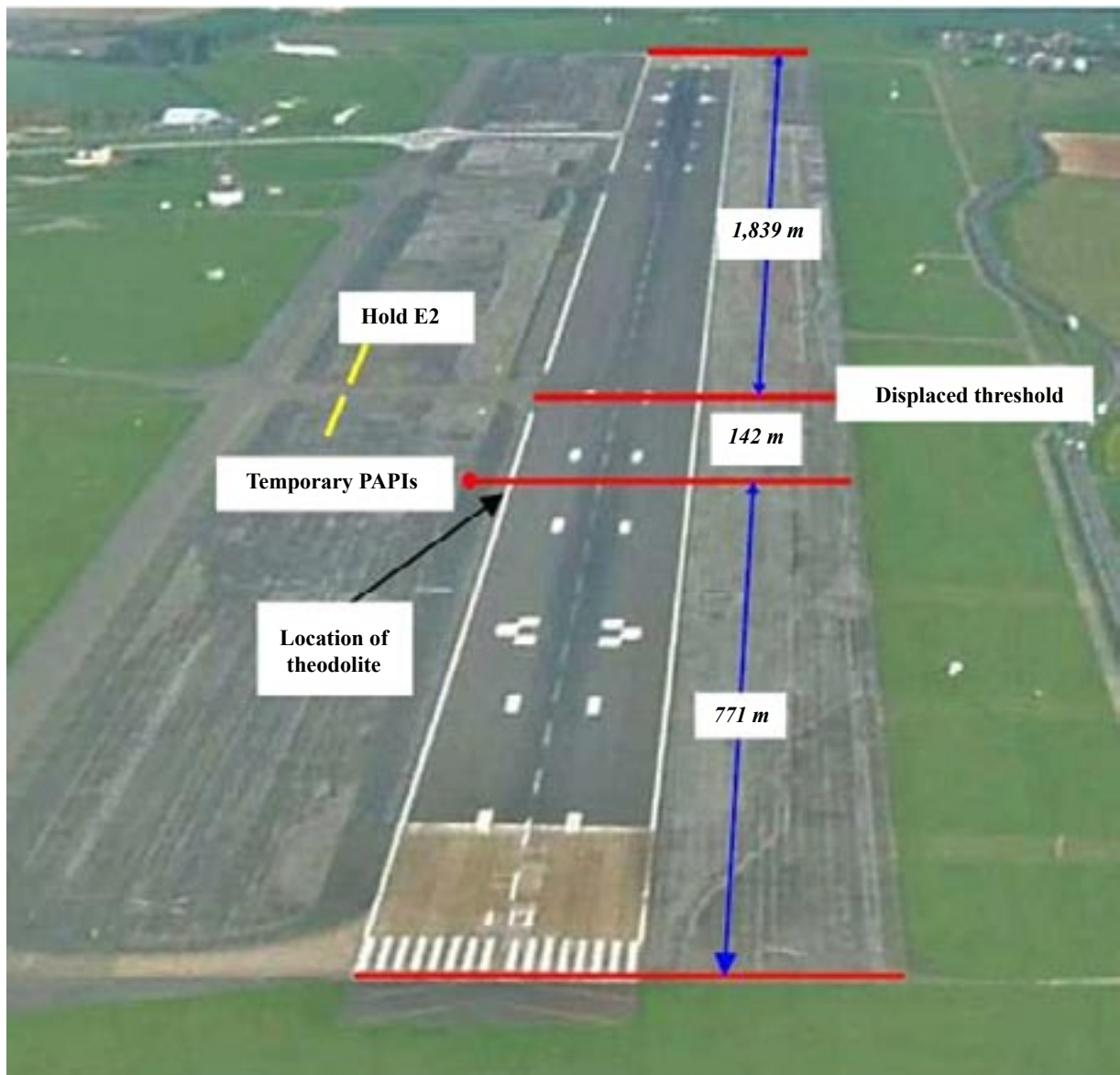
Tyre marks north of the painted runway edge, close to the point of impact with the theodolite, indicated that the aircraft had crossed partially onto the sterile area before turning back towards the active section.

#### **Airfield information**

Manston Airport has a single, broad, asphalt and concrete runway, laid originally to provide a large landing area for damaged military aircraft. Currently Runway 10/28, which is 2,752 m long and 61 m wide, forms the central part of this area; it is marked in accordance with standards published in Civil Aviation Publication (CAP) 168 - *Aerodrome Licensing*. The temporary PAPI installation and associated survey activity was located at the left hand edge of Runway 10, 771 m east of the normal touchdown threshold. The displaced threshold was a further 142 m east of this position and identified by a pair of black and white marker boards placed in accordance with CAP 168. This resulted in an LDA of 1,839 m. (See Figure 1.)

#### **Meteorological information**

Information recorded at the time of the incident indicated a surface wind from 100° at 12 kt, varying between 060° and 140°; 6,000 m visibility, sky clear, temperature 15°C and dew point 11°C. The runway surface was damp.

**Figure 1**

Runway Overview

**Other information**

The pilot flew with an instructor on the following day in order to assess her conduct of landings beyond the temporary displaced threshold. Her technique appeared to be to approach the runway as though its full length was available and then to fly level in the landing configuration until crossing the displaced threshold. Her landings showed a marked improvement after the instructor briefed her to plan and execute an approach

by reference to the displaced threshold alone. The Chief Flying Instructor of the flying school stated that, following this exercise, he was satisfied that the pilot was competent to exercise the privileges of her licence.

**Analysis***Aircraft performance*

The nose-up attitude of the aircraft and its sudden drop indicates that it stalled just prior to touchdown,

probably as a consequence of flying level in the landing configuration as demonstrated during the pilot's subsequent flight with an instructor. It is also consistent with the pilot's statement that she allowed the aircraft to become slow.

#### *Other damage*

The location of damage to the guard light suggested that the aircraft had manoeuvred in the sterile area adjacent to the taxiway at Hold E2, a considerable distance from the active runway. However, the survey personnel did not recall seeing the aircraft in that location at any time during the incident, and tyre marks found at the

site indicated that it had regained the active runway almost immediately after hitting the theodolite. There were no reports immediately prior to the incident of the aircraft having suffered impact damage. Therefore, it is possible that the aircraft hit the guard light as it entered Runway 10 for the intended flight.

#### **Conclusion**

The early touchdown and loss of directional control probably resulted from the decision of the pilot to approach the runway as though its full length was available and then to fly level in the landing configuration until crossing the displaced threshold.