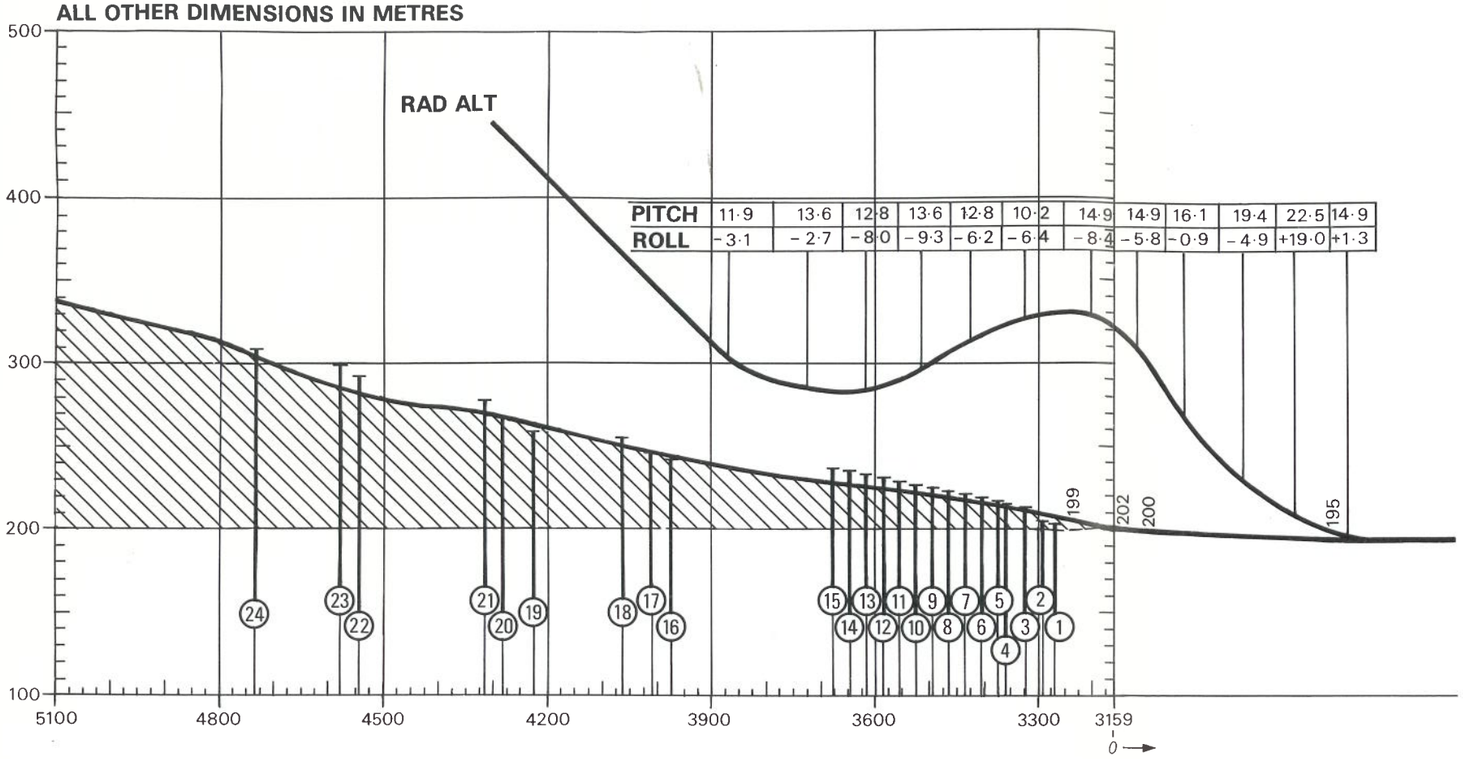
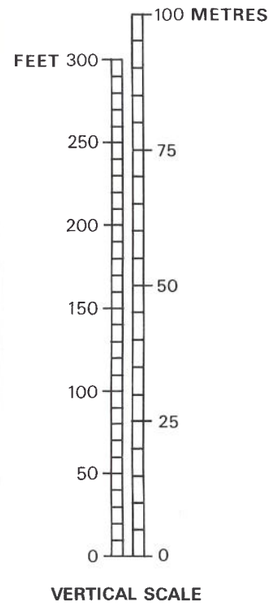
AERODROME OBSTRUCTION CHART - ICAO

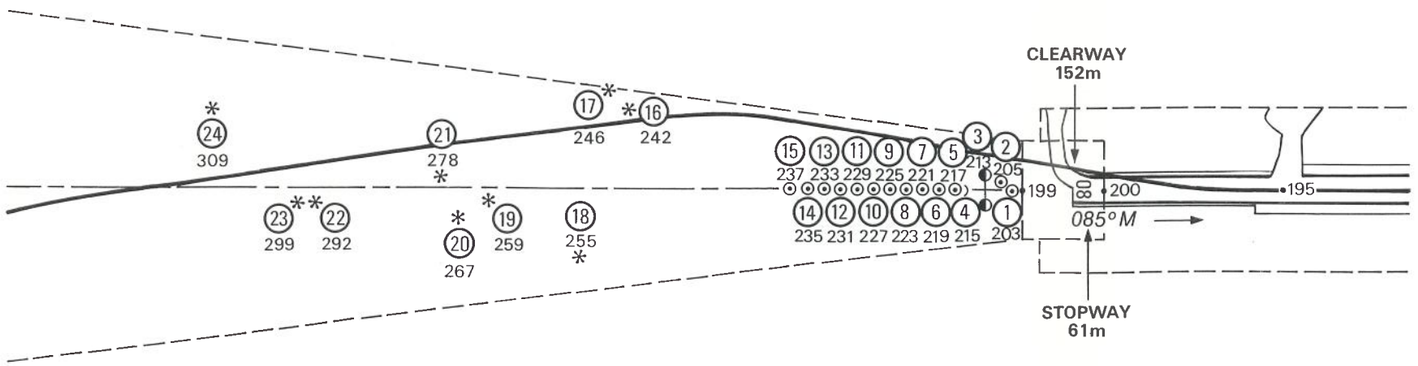
Appendix 1

ELEVATIONS IN FEET
ALL OTHER DIMENSIONS IN METRES

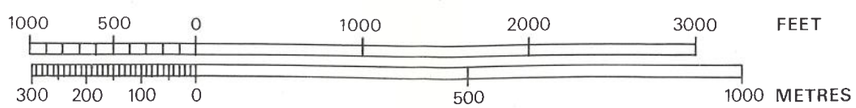




VERTICAL SCALE



HORIZONTAL SCALE

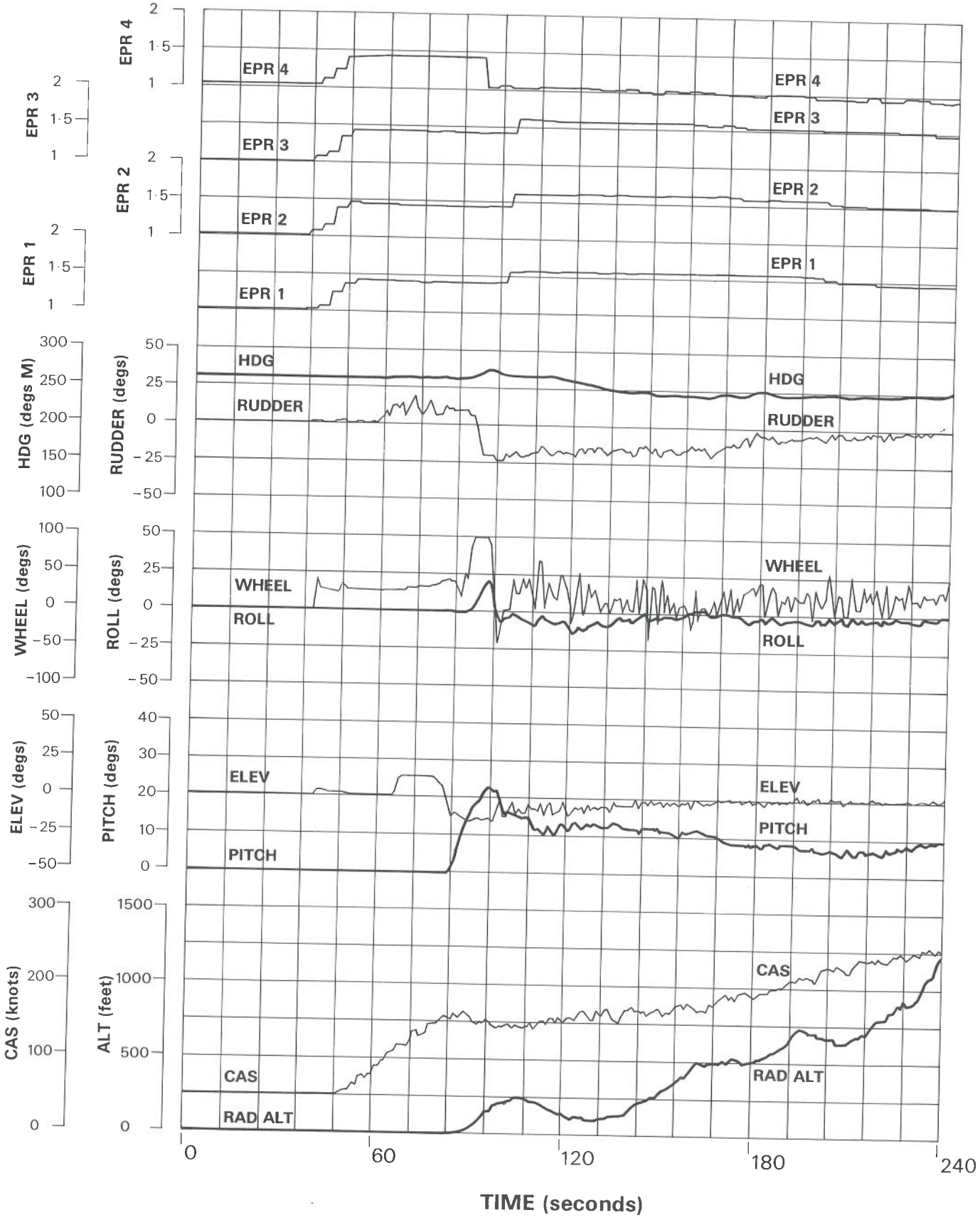


LEGEND

IDENTIFICATION No.	(23)
HEIGHT AOD	299
TREE OR SHRUB	*
APPROACH LIGHT, PYLON, POLE, ETC.	⊙
ILS	
TERRAIN PENETRATING OBSTRUCTION PLANE	

B747 N605PE

Selected DFDR Parameters



Appendix 3

PILOT TRAINING - REGULATIONS AND GUIDANCE

1. *UK Air Operators* - CAP 360

The CAA issues guidance on pilot training and checking to UK holders of an Air Operator's Certificate in CAP 360. Chapter 4 of Part 1 of this publication details the requirements for the bi-annual competency check for pilots in command. Engine failure during take-off is covered in the following section:

"4.3 Base checks - Pilots in command

4.3.1 The bi-annual base check provides an opportunity for the practice of emergency drills and procedures which rarely arise in normal operations, and can generally be regarded as continuation training. The statutory requirement, however, is that pilots shall be tested, and their continued competence must be verified and certified.

4.3.2 The scope of the practice and check may be divided into three main categories, as follows:

(a) emergency manoeuvres in instrument flight conditions, including:

(i) take-off with engine failure between V_1 and V_2 or as soon as safety consideration permit.....

(b) emergency procedures including, as appropriate:

(iv) engine failure before V_1.

(c) a supplementary questionnaire ....."

2. *Air Carriers and Commercial Operators of Large Aircraft* - FAR Part 121-424

The FAA issues similar guidance to 'Air Carriers and Commercial Operators of Large Aircraft' in Appendix E (Flight training requirements) and Appendix F (Proficiency check requirements) to Chapter 25 of FAR Part 121. Both appendices schedule take-off manoeuvres / procedures as follows:-

> (1) At a point after V_1 and before V_2 that in the judgement of the person conducting the check is appropriate to the airplane type under the prevailing conditions: or
>
> (2) At a point as close as possible after V_1 when V_1 and V_2 or V_1 and V_R are identical"

3.(a) *Extract from Continental Airlines' B 747 flight training (initial, transition and upgrade simulator):*

Third period	engine failure following a normal noise abatement take off (two events)
Fourth period	V_1 cut, (two events: one at maximum take-off weight)
Fifth period	V_1 cut (two events)
Sixth period	Engine failure on take-off (400-800 IFR)
Seventh period	V_1 cut (two events, second one with IFR at 100 ft)

3(b) *Flight operations / Training Manual:*

Proficiency check / Recurrent training:

Item 8:	Engine failure at V_1

4. AIR CARRIER OPERATIONS BULLETIN NO. 8-88-3- VERIFY AIR CARRIER SIMULATOR TRAINING PROGRAMS INCLUDE ENGINE FAILURES IN THE POST TAKEOFF CLIMB SEGMENT (NTSB SAFETY RECOMMENDATION A-87-9)

a. As a result of an air carrier accident investigation involving the loss of the right engine of a McDonnell-Douglas DC-9-14 aircraft, the National Transportation Safety Board (NTSB) concluded that takeoff engine failure training involving a loss of thrust as the airplane approaches or passes V_1 speed may have been a factor.

b. The NTSB believes that the captain reacted primarily to other than visual and flight instrument references, such as kinesthetic cues. He apparently misinterpreted those cues and applied the flight controls incorrectly. Analysing engine failures and maintaining directional control of the airplane by reference to flight instruments are basic procedures for the air carrier pilot. However, the NTSB believes infrequent training for engine failure at low altitude has left the flight crew ill-prepared to cope with this emergency.

c. Principal operations inspectors should review their assigned carriers' approved simulator training programs to verify that they include engine failures in the post takeoff climb, with emphasis on the use of engine and flight instruments as the primary source of information for airplane control and on the need for deliberate actions based on flight and engine instruments analysis, rather than hasty action based on kinesthetic cues.

Printed in the United Kingdom for Her Majesty's Stationery Office
Dd. 290485, C7, 8/89