Appendix A.  List of persons killed

Flight crew
Captain S J L Key
S/O J W Keighley
S/O S Ticehurst

Cabin crew
S/Steward F Farey
Steward A Lamb
Stewardess J K Mowat

Passengers
Captain J Collins
F/O C K Ware
F/O R E Wilde
Mrs M Abrams
Mr P Abrams
Mrs Adams
Mr F W Adams
Mr A J Alabaster
Mrs H Benjamin
Mrs Borgmans
Mr A Borgmans
Dr I M Campbell
Mr M J Cesar
Mr M J Clarizio
Mr E A Coleman
Mrs de Haes
Mr E F de Haes
Miss A de Waele
Mr R G Driver
Mrs D W Everitt
Mr D V Everitt
Mr F P Farmann
Mr Felix
Mr R P Field
Mr S P Frederick
Mr C Gascou
Mr P Glennie-Smith
Dr M Golomb-Fingenbaum
Mr E J Gray
Mr J D Gray
Mrs A F Haerle
Mr H O Halstengaro
Mrs S Hansen
Miss G Hansen
Miss H Hansen
Miss K Hansen
Master P Hansen
Mrs J D Harlowe
Mr A J Harrison
Miss E Hawthorn
Mrs K Hoehn
Mr K W Hoehn
Mr B Husapongasa
Mr G P Jackson
Mr L Jackson
Dr S W Kadleigh
Dr G Kandalla
Dr K Kandalla
Mr G Keogh
Mr P Kilfeather
Mrs M A Kolby
Mr F Kolby
Dr V L Lanza
Mr L M Lohrin
Mr G A Lucy
Mr V K Malik
Miss H McClure
Mr J L Meyers
Mrs A Michiels
Mr E E Michiels
Mr L Miller
Mr M Miller
Mr F M Mooney
Mr W R Murray
Mrs H F Obst
Mr M Obst
Mr C Offie
Mr M W O'Reilly
Mr V O Paseku
Mr G C Poplett
Dr R J Raeside
Mr S Ranger
Mr O Reusch
Mr M Rigby-Jones
Dr J N Ruben
Mrs C Sabini
Mr R Sabini
Lt Cmrd H J Sampson
Mr P M Simon
Dr R L Slinger
Mrs M Smith
Mr W E Smith
Mr C A Smith
Dr E S Stewart
Dr T F Stewart
Dr M Y Stevenson
Mrs R Strang
Mr G Strang
Mr E C Stivers
Mr M J Sweetman
Mr J J Tirou
Mr G L Towne
Mr G Turner
Mrs V P Underhill
Mr C A M van Bavel
Mr J L van Beurden
Mr C van de Put
Mr J Vandevelde
Mrs M van Haeran
Master E van Haeran
Mr H van Meines
Mr H Vergara
Mrs C S Warmoes
Mr P Warmoes
Mr R W Weaver
Mr I Webb
Mr R P Wold
Mrs B J Wynn
Mr J D Wynn
Miss D Wynn
Miss S E Wynn
Mrs M Wynn
Appendix B.  Appearance

HM Attorney General (The Rt Hon Sir Peter Rawlinson, QC, MP)
Mr Anthony J L Lloyd, QC and Mr Michael Thomas (instructed by the
Treasury Solicitor) appeared on behalf of the Attorney General

Mr John Griffiths, QC and Mr T R A Morison (instructed by Mr Michael
Lester) appeared on behalf of the British European Airways Corporation

Mr Peter Webster, QC and Mr Anthony Barrowclough (instructed by
Messrs Simmons & Simmons) appeared on behalf of Hawker Siddeley
Aviation

Mr Bruce Coles (instructed by Mr Alan Smith) appeared on behalf of Smiths
Industries

Mr Norman Tapp, QC and Mr Gordon Slynn (instructed by the Treasury
Solicitor) appeared on behalf of the Department of Trade and Industry

Mr D Henry (instructed by Messrs Stanleys and Simpson North) appeared as
Counsel for the Civil Aviation Authority

Mr Patrick Phillips (instructed by Messrs Evan Davies & Co) appeared as
Counsel on behalf of Captain S J L Key (deceased) Captain of the Aircraft

Mr T Scott Baker (instructed by Messrs Evan Davies & Co) appeared as
Counsel on behalf of Mr J W Keighley (deceased) Second Officer and Mr S A
Ticehurst (deceased) Second Officer

Mr M W T Nott (instructed by Mr Timothy Walker) appeared on behalf of
the British Airports Authority.

Mr Anthony Evans, QC and Mr Jonathan Gilman (instructed by Messrs
Lovell, White & King) appeared on behalf of certain passengers’ representatives

Mr Lee S Kreindler (of the New York Bar) (Messrs Frere Cholmeley & Co
London Solicitors) appeared on behalf of certain passengers’ representatives

Mr Morris Finer, QC* and Mr Andrew Collender (instructed by Messrs Evan
Davies & Co) appeared as Counsel on behalf of the British Airline Pilots
Association

Mr Ronald L M Goldman (of Messrs Goldman, Gangloff & Boehme, Beverly
Hills, California, USA) appeared as Counsel on behalf of the heirs of the estate
of Hilde Benjamin.

* Mr Finer was during the course of the Inquiry appointed to the Bench. Mr Collender thereafter
continued to represent BALPA.
Appendix C.  List of witnesses

Mr R Ashford  CAA, Airworthiness Division
Dr G Bennett  CAA, Chief Medical Officer
Mr D G Brinjes  BEA, Air Safety Branch
Mr A E R Broomfield  AIB, Senior Inspector
Mr C S Caliendi  HSA, Chief Systems Engineer
Mrs A Cass  Eye Witness
Mrs F M Castledine  Eye Witness
Capt G W Childs  BEA Line Captain
Mr G C Chouffot  CAA, Director Flight Operations
Mr R H Chowns  BEA Principal Noise Engineer
Capt D P Clifton  BEA Base Training Captain
Mr J Coleman  Eye Witness
Mr A J Cope  BEA Chief Design and Development Engineer
Capt J A Corblishley  BEA, Flight Manager No 1 Trident Flight
Sqn Ldr S A Cullen  RAF Pathologist
Mr J Cunningham  HSA, Chief Test Pilot
Mr D Cuthbertson*  AIB (deceased), Senior Inspector
Mr D P Davies  CAA, Airworthiness Division
Mr R A Davies  BEA, Senior Development Engineer
Capt F H Dell  BEA, Flight Manager No 4 Trident Flight
Mr D H Dykins  HSA, Assistant Chief Aerodynamicist
Capt D Evans  BEA, Flight Manager No 3 Trident Flight
Mr R G Feltham*  AIB, Senior Inspector
F/O R A Flavell  BEA Line Pilot
Capt J C Forshaw  CAA, Senior Flight Operations Inspector
Dr M M Gertler  Consultant Cardiologist, USA
Mr H K Gordon-Burge  BEA, Air Safety Branch
Capt G A C Gray  BEA, Assistant Flight Manager No 2 Trident Flight

*  Statement read
Capt K Hagyard  BEA Line Captain
Mr J A Hancock  CAA, Operations — Training/Licensing
Capt F B Hazard  BEA Line Captain
Mr I Heller  Eye Witness
Mr H D Henniker  BEA, Principal Development Engineer
                 (Mechanical Systems)
Capt L F J Holdstock  BEA, Flight Manager Training
Mr J G Holton  AIB, Senior Inspector
Mr J R D Kenward*  BEA, Manager Performance Engineering
Mr B J Lee  BEA, Principal Development Engineer
                 (Electrical Systems)
Mr J H Lett*  AIB, Senior Inspector
Capt E W Lowden  BEA, Operations Director
F/O W W Macdonald  BEA Line Pilot
Capt A R Martin  BEA Deputy Flight Manager Training
Gp Capt J F K Mason  RAF Pathologist
Mr J R Neill  CAA, Director of Flight Safety
AVM P J O'Connor  RAF Consultant in Neuropsychiatry
Capt C Owens  BEA, General Manager Flight Operations
Mr J G M Pardoe  CAA, Director General Safety (Airworthiness)
Capt W C Parke  BEA Line Captain
Mr W H Perry  CAA, Training and Licensing
Capt E Poole  BEA, Flight Development Manager
Dr F S Preston  Senior Medical Officer (Air) Air Corporations
                 Joint Medical Service
Mr B E Roberts  BEA, Flight Simulator Instructor
Dr H P Ruffell-Smith  Consultant
Mr T C Ryan  CAA, Transcription Unit
Dr A J Salmon  Family Doctor, Captain Key
Capt R Seed  BEA, Flight Manager No 2 Trident Flight
Mr A Sherring  CAA, Inspection Surveyor
Dr W Somerville  Consultant Cardiologist
F/O J E Spain  BEA Line Pilot
Capt G K A Thorne  BEA Line Training Captain
Mr P Waller  BEA, Assistant Development Engineer (AIDS &
                 ATE)

* Statement read
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tr>
<td>Capt L Wallis</td>
<td>BEA, Flight Manager No 5 Trident Flight</td>
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<tr>
<td>Mr J L Weston</td>
<td>Smith's Industries</td>
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<tr>
<td>Capt D B White</td>
<td>BEA Line Captain</td>
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<tr>
<td>F/O K J Whitehead</td>
<td>BEA Line Pilot</td>
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<tr>
<td>Mr G C Wilkinson</td>
<td>AIB, Senior Inspector</td>
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<tr>
<td>Mr J W Wilson</td>
<td>IISA, Chief Operations Engineer</td>
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<tr>
<td>Capt E R Wright</td>
<td>BEA Line Captain</td>
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### Appendix D. Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AIB</td>
<td>Accidents Investigation Branch (DTI)</td>
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<tr>
<td>A/P</td>
<td>autopilot</td>
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<tr>
<td>ARB</td>
<td>Air Registration Board</td>
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<tr>
<td>ASI</td>
<td>airspeed indicator</td>
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<tr>
<td>ASB</td>
<td>Air Safety Branch (BEA)</td>
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<tr>
<td>ATC</td>
<td>Air Traffic Control</td>
</tr>
<tr>
<td>auw</td>
<td>all-up weight</td>
</tr>
<tr>
<td>BAA</td>
<td>British Airports Authority</td>
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<td>BALPA</td>
<td>British Airline Pilots Association</td>
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<td>BEA</td>
<td>British European Airways Corporation</td>
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<tr>
<td>BOAC</td>
<td>British Overseas Airways Corporation</td>
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<td>CAA</td>
<td>Civil Aviation Authority</td>
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<tr>
<td>CAADRP</td>
<td>Civil Aviation Authority Data Recording Project</td>
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<tr>
<td>CVR</td>
<td>cockpit voice-recorder</td>
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<tr>
<td>CWS</td>
<td>central warning system</td>
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<tr>
<td>DFS</td>
<td>Directorate of Flight Safety</td>
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<td>DTI</td>
<td>Department of Trade and Industry</td>
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<tr>
<td>EAS</td>
<td>equivalent airspeed</td>
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<tr>
<td>ECG</td>
<td>electrocardiogram</td>
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<tr>
<td>FDR</td>
<td>flight data recorder</td>
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<tr>
<td>F/O</td>
<td>First Officer</td>
</tr>
<tr>
<td>FSIB</td>
<td>Flying Staff Information Bulletin</td>
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<tr>
<td>GMFO</td>
<td>General Manager Flight Operations</td>
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<tr>
<td>GMT</td>
<td>Greenwich mean time</td>
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<tr>
<td>HSA</td>
<td>Hawker Siddeley Aviation</td>
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<tr>
<td>IAS</td>
<td>indicated airspeed</td>
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<tr>
<td>ILS</td>
<td>instrument landing system</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>NDB</td>
<td>non-directional beacon</td>
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<tr>
<td>Abbreviation</td>
<td>Definition</td>
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<tr>
<td>--------------</td>
<td>--------------------------------</td>
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<tr>
<td>P1</td>
<td>first pilot</td>
</tr>
<tr>
<td>P2</td>
<td>second pilot</td>
</tr>
<tr>
<td>P3</td>
<td>third pilot</td>
</tr>
<tr>
<td>P4</td>
<td>fourth pilot</td>
</tr>
<tr>
<td>QFE</td>
<td>barometric pressure at airport level</td>
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<tr>
<td>R/T</td>
<td>radio-telephone</td>
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<tr>
<td>S/O</td>
<td>Second Officer</td>
</tr>
<tr>
<td>SFO</td>
<td>Supervisory First Officer</td>
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<tr>
<td>V2</td>
<td>safety speed for take-off</td>
</tr>
<tr>
<td>VDF</td>
<td>very high frequency direction finding</td>
</tr>
<tr>
<td>VHF</td>
<td>very high frequency</td>
</tr>
<tr>
<td>VNA</td>
<td>safety speed at noise-abatement</td>
</tr>
<tr>
<td>VOR</td>
<td>visual omni-range</td>
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</table>
CREW INCAPACITY IN FLIGHT

These procedures should be followed unless the situation clearly indicates that some deviation is justified.

Captain Incapacitated:
1. Captain to be strapped into the P1 seat.
2. Command to be assumed by second-in-command and both ATC and the crew notified of this.
3. Command function to be exercised from either P2 or P3 seat, depending on the phase of flight.

P2 Incapacitated:
1. P2 to be strapped into P3 seat.
2. Co-pilot duties to be carried out from the P2 seat.
3. ATC to be advised of the incapacitation.

P3 Incapacitated:
1. P3 to be strapped in P3 seat if on final approach, but, if time permits, to be removed from seat and P2 re-positioned in P3 seat.
2. ATC to be advised of the incapacitation.
FLIGHT RECORDER DATA

FIG.1

HEIGHT
FEET

2000
1500
1000

TAILPLANE ANGLE

DEG

TPA
QNH(10045mb)
QFE(1001mb)
PILOT'S INDICATED ALTITUDE
TAILPLANE ANGLE

PITCH ANGLE

SPEED
KNOTS

200
150
100

ESTIMATED TIME FROM BRAKES-OFF—SECONDS

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

BROKEN LINES GIVE APPROXIMATE EXTRAPOLATIONS

AUTOPilot ENGAGED
FLAPS SELECTED UP
DROOP SELECTED IN
AUTOPilot DISENGAGED
ASI ON STOP

0

20

30

PITCH ANGLE DEG

PULL

30

10

5

0

20

30

PULL

30

10

5

0

20
# TABULATED CHRONOLOGY OF LAST FLIGHT OF TRIDENT C–ARPI 18 JUNE 1972

Derived from Flight Recorder and R/T transcription information

<table>
<thead>
<tr>
<th>Seconds from start of take-off</th>
<th>Events</th>
<th>Time</th>
<th>Pilot's indicated alt QFE</th>
<th>IAS knots</th>
<th>Rtg °M</th>
<th>Pitch att</th>
<th>Bank angle°</th>
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<tr>
<td>0</td>
<td>Brakes off</td>
<td>0</td>
<td>1608:30</td>
<td>0</td>
<td>54</td>
<td>277</td>
<td>0.4</td>
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<tr>
<td>42</td>
<td>Rotation</td>
<td>42</td>
<td>1609:12</td>
<td>2</td>
<td>144</td>
<td>277</td>
<td>4.6</td>
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<tr>
<td>44</td>
<td>Unstick</td>
<td>44</td>
<td>1609:14</td>
<td>2</td>
<td>145</td>
<td>276</td>
<td>11.6</td>
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<tr>
<td>54</td>
<td></td>
<td>54</td>
<td>1609:24</td>
<td>99</td>
<td>163</td>
<td>275</td>
<td>14.4</td>
</tr>
<tr>
<td>68</td>
<td>Autopilot engagement</td>
<td>68</td>
<td>1609:33</td>
<td>355</td>
<td>170</td>
<td>272</td>
<td>14.4</td>
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<tr>
<td>74</td>
<td>Start of left turn</td>
<td>74</td>
<td>1609:44</td>
<td>690</td>
<td>170</td>
<td>272</td>
<td>14.4</td>
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<tr>
<td>83</td>
<td>*Baseline 548 is climbing as cleared</td>
<td>83</td>
<td>1609:53</td>
<td>985</td>
<td>172</td>
<td>256</td>
<td>15.5</td>
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<tr>
<td>85</td>
<td>*548 airborne at 09 contact 128,4 Goodday</td>
<td>85</td>
<td>1609:55</td>
<td>.064</td>
<td>171</td>
<td>252</td>
<td>15.5</td>
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<tr>
<td>90</td>
<td>*Roger</td>
<td>90</td>
<td>1609:60</td>
<td>.235</td>
<td>169</td>
<td>241</td>
<td>14.8</td>
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<tr>
<td>93</td>
<td>Flap selected up (start of noise-abatement)</td>
<td>93</td>
<td>1610:03</td>
<td>.335</td>
<td>169</td>
<td>236</td>
<td>15.5</td>
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<tr>
<td>100</td>
<td>*Baseline 548 is climbing as cleared passing 1500</td>
<td>100</td>
<td>1610:10</td>
<td>.566</td>
<td>165</td>
<td>221</td>
<td>16.2</td>
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<tr>
<td>103</td>
<td>*548 climb to FL 60 squawk 6615 (flap fully retracted)</td>
<td>103</td>
<td>1610:13</td>
<td>.637</td>
<td>160</td>
<td>215</td>
<td>15.8</td>
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<tr>
<td>114</td>
<td>Droop selected up</td>
<td>114</td>
<td>1610:24</td>
<td>.772</td>
<td>162</td>
<td>191</td>
<td>14.4</td>
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<tr>
<td>122</td>
<td>Droop retracted 1</td>
<td>122</td>
<td>1610:32</td>
<td>1637</td>
<td>170</td>
<td>179</td>
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<tr>
<td>124</td>
<td>Second stick-push 1</td>
<td>124</td>
<td>1610:33</td>
<td>.562</td>
<td>177</td>
<td>180</td>
<td>5.6</td>
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<tr>
<td>127</td>
<td>Third stick-push 1</td>
<td>127</td>
<td>1610:36</td>
<td>1403</td>
<td>182</td>
<td>182</td>
<td>-2.5</td>
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<tr>
<td>128</td>
<td>Stick-push 'dump' operated 1</td>
<td>128</td>
<td>1610:37</td>
<td>.360</td>
<td>187</td>
<td>184</td>
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<tr>
<td>130</td>
<td>Last reliable IAS and attitude</td>
<td>130</td>
<td>1610:39</td>
<td>.276</td>
<td>192</td>
<td>186</td>
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<tr>
<td>134</td>
<td>IAS on lower stop</td>
<td>134</td>
<td>1610:43</td>
<td>1200 5</td>
<td>54</td>
<td>185</td>
<td>31.3</td>
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<tr>
<td>130</td>
<td>Impact</td>
<td>130</td>
<td>1611:00</td>
<td>54 4</td>
<td>217</td>
<td>-6.0</td>
<td>+14.1</td>
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</tbody>
</table>

**Notes:**

1. These events deduced from flight recorder data.
2. Inaccurate IAS due to aircraft attitude change.
3. Estimated attitude.
4. Lowest figure that can be recorded.
5. Minus indicates left bank. Plus indicates right bank.
6. Underlined words indicate timing points.

* Radio calls.
DEDUCED GROUND TRACK OF LAST FLIGHT OF TRIDENT G-ARP I

LEGEND
NUMBERS ON PLOT REFER TO TIME IN SECONDS FROM BRAKES OFF
GRAPH OF TAIL PLANE ANGLES AND INCIDENCE

INCIDENCE ABOVE WHICH STICK PUSHER OPERATES
DROOP DOWN

INCIDENCE ABOVE WHICH STICK SHAKER OPERATES
DROOP DOWN

CALCULATED INCIDENCE FROM
DROOP UP \( \theta \approx \alpha \)
DROOP DOWN \( \theta \approx \alpha \)

INCIDENCE ABOVE WHICH STICK PUSHER OPERATES
DROOP UP

INCIDENCE ABOVE WHICH STICK SHAKER OPERATES
DROOP UP

RECORDED TAILPLANE ANGLE

ESTIMATED AIRCRAFT INCIDENCE \( \alpha \) DEG.

ESTIMATED TIME FROM BRAKES OFF
FIG. 6 POWER OFF STALLING SPEEDS

HANDLING LIMITATIONS (j)