



DEPARTMENT OF TRANSPORT

# **RAILWAY ACCIDENT**

**Report on the Collisions that  
occurred on 18th August 1981  
at Parks Bridge Junction  
and on 13th November 1981  
at Bromley Junction**

IN THE  
SOUTHERN REGION  
OF BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

£3.90 net

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RAILWAY INSPECTORATE,  
DEPARTMENT OF TRANSPORT,  
2 MARSHAM STREET,  
LONDON SW1P 3EB,  
15th December 1983.

SIR,

I have the honour to report for the information of the Secretary of State in accordance with the Direction dated 27th August, 1981, the result of my Inquiry into the collision between two electric passenger trains at 08.05 on Tuesday, 18th August, 1981, at Parks Bridge Junction, between London Bridge and Hither Green, and in accordance with the Direction dated 19th November, 1981, the result of my Inquiry into the collision between two electric passenger trains at 08.28 on Friday, 13th November, 1981, at Bromley Junction, between Norwood Junction and Crystal Palace, in the Southern Region of British Railways.

Although the two collisions were not directly connected, they were in many ways similar and thus I consider it appropriate to deal with both the accidents in a single report with conclusions, remarks and recommendations drawn from the Inquiry into each accident as is appropriate.

In the first collision, the driver of the 07.49 Charing Cross to Bromley North electric multiple-unit passenger train, 2J04, consisting of eight coaches and travelling on the Down Fast line, passed a signal at Danger and observed the 06.18 Dover Priors to Cannon Street electric multiple-unit express passenger train, 1G51, consisting of twelve coaches, crossing from the Up Fast line to the Up Slow line ahead of him. The driver of the Down train immediately made an emergency brake application but was unable to avoid the nearside corner of his driving cab from striking the nearside of the rearmost driving cab of the Up train. Fortunately the collision was not sufficiently severe to cause a derailment but damage was caused to the side panels and windows of both driving cabs and the associated hand rails. There was no significant damage to the passenger accommodation and no passengers were injured.

The Up train, after being stopped for examination, was allowed to proceed under caution to Cannon Street, but the Down train 'trailed' the switch diamonds at the junction and came to a stand with the head of the train on the Up Fast line, facing in the Down direction. Luckily no derailment occurred and the train with its passengers was subsequently moved over the Up Fast line in the wrong direction to Hither Green where the passengers were detrained and carried forward on other services.

Damage to the track and signalling equipment was minimal and, although a number of train services were cancelled, delayed or re-routed, the junction was reopened to normal traffic later the same day.

In the second collision, the 08.23 Beckenham Junction to Victoria electric multiple-unit passenger train, 2R66, consisting of four coaches, struck the offside of the leading coach of the 08.22 West Croydon to London Bridge electric multiple-unit passenger train, 2K44, formed of eight coaches, where the Up Crystal Palace spur joins the Up Bromley line to form the Up Crystal Palace line, the latter train having passed the signal protecting the junction at Danger. The collision resulted in the leading three coaches of train 2K44 being derailed, together with the leading two coaches of train 2R66; substantial damage occurred to the derailed coaches.

The emergency services were summoned and arrived at the difficult site approximately 19 minutes later, by which time all passengers had been detrained from both trains and escorted by railway staff along the track to Crystal Palace Station. No passengers or railway staff were seriously injured but six passengers received minor injuries or shock, as did both members of the crew of train 2K44.

Both lines at Bromley Junction were closed to traffic to enable rerailing and the necessary track repairs to be carried out. The Down line was restored to traffic at 08.35 on 14th November and the Up line at 11.01 the same day.

The weather at the time of both accidents was fine with good visibility.

#### DESCRIPTION

##### *Parks Bridge Junction—Site and Signalling*

1. Parks Bridge Junction lies on the Main line between Charing Cross, Cannon Street and London Bridge, and Orpington, Tonbridge and the South East. The adjacent stations to the junction are St Johns on the London side and Hither Green on the country side. There are four lines from East to West, Down Slow, Up Slow, Down Fast, and Up Fast. The junction consists of crossovers between Down Fast and

Down Slow, Up Slow and Up Fast, Down Slow and Down Fast with switch diamonds, and Up Fast and Up Slow with switch diamonds. In addition, the Ladywell Loop diverges from the Up and Down Fast lines and the Up and Down Lewisham Loop diverges from the Up and Down Slow lines. A general site plan showing the relevant signalling, track layout and the point of the collision, together with a location diagram is at the back of the Report.

2. All signals in the area of Parks Bridge Junction are of the four-aspect colour-light type. The colour-light signalling in the area was introduced in February 1976, replacing a life expired colour-light installation. The interlocking for the area is in a relay room at Parks Bridge Junction, with the control from London Bridge Signal Box being by means of microcore cables. Automatic Warning System (AWS) track equipment was installed throughout the area at the time of the resignalling.

3. There is a permanent speed restriction of 45 mile/h on all running lines in the area of the junction due to curvature. The approach view of Signals L267 and L271 on the Down Fast line is however quite adequate.

4. Whilst the full overlap of Signal L271 is 242 yards, thereby preventing a movement from the Up Fast to the Up Slow via Points 873/869/867 reverse when a route is set from Signal L267 to L271, a reduced overlap of 94 yards is also provided clear of Points 869. This facility may be used at the discretion of the signalman by operating a separate device on the control panel. In these circumstances Signal L267 will only clear once the approaching train has been brought to, or nearly to, a stand. This control is enforced by the occupation of Track Circuit YL for 15 seconds before the signal is allowed to clear. This track circuit is 158 yards long. If Signal L267 is set in a reduced overlap condition and Signal L271 is subsequently cleared, Signal L267 will 'step up' to a full aspect and also clear. If then the route on Signal L271 is subsequently cancelled, the full overlap will remain.

5. The signalling controls include approach locking which is activated if a signal is restored to Danger when a train is approaching. A two-minute time delay is provided to release this control in respect of the relevant signals. All signal lamps are of the double-filament type with automatic changeover should the first filament fail. Complete failure of a lamp places or maintains the signal in rear at Danger.

6. AWS ground equipment was commissioned in the area in December 1978.

#### *Bromley Junction—Site and Signalling*

7. Bromley Junction in the Up direction is a single trailing junction between the Up Crystal Palace spur from Norwood Junction and the Up Bromley line from Beckenham Junction; the station on the London side of the junction is Crystal Palace. Up trains may then proceed to Victoria or London Bridge. A site plan showing relevant details of the track layout, signalling and the point of the collision, together with a location diagram, is at the back of this report.

8. The signalling in the vicinity of Bromley Junction is three aspect, except for signals JC88 and JC95, at the London end of Norwood Junction Station, which are four aspect. Colour-light signalling in the area was introduced in July 1969, controlled from Norwood Junction Signal Box. Control of the area was transferred to Victoria Signal Box on 9th August 1981, when a new interlocking was brought into use at Crystal Palace, controlled over a Time Division Multiplex system. The signal positions remained unchanged when the control was transferred. The location of Signal VC744, the signal which was passed at Danger, is on a rising gradient of 1 in 100 on a sharp left hand curve. The approach view of the signal is approximately 120 yards. The maximum permitted speed on the Up Bromley line from Beckenham Junction is 50 mile/h, while that on the Up Crystal Palace spur is 30 mile/h, reducing to 20 mile/h when passing through Bromley Junction.

9. The signalling controls include approach locking which is activated if a signal is restored to Danger when a train is approaching. A two-minute time release of these controls is provided in respect of the relevant signals. All signal lamps are of the double filament type with automatic changeover should the first filament fail. Complete failure of a lamp places or maintains the signal in rear at Danger.

10. AWS ground equipment was commissioned at Signals VC744 and VC746 on 9th August 1981 as part of the Victoria re-signalling scheme.

#### *The Courses of the Accidents and Damage to the Trains*

11. Both accidents were due to the drivers of trains passing the signals protecting the junctions at Danger. At Parks Bridge Junction the driver of the Charing Cross to Bromley North EMU, having been brought nearly to a halt at Signal L267 on the Down Fast line before it changed to a single Yellow because the reduced overlap for Signal L271 had been selected, on account of the route for the Dover to Cannon Street express, 1G51, having been set across the path of the other train, accelerated and passed Signal

L271 at Danger. The driver, on observing the express crossing his path some 80 yards away, immediately made an emergency brake application but was unable to prevent the nearside corner of his driving cab from striking the nearside corner of the rearmost cab of the Up express.

12. The damage to both trains was very slight and the driver of train 1G51 did not realise that a collision had occurred until the train was stopped by the London Bridge signalman for examination. The Down train, 2J04, came to a stand with its front on the crossover leading to the Up Fast line, having run through the switch diamonds and travelled some 75 yards beyond them. Train 2J04 consisted of two 4-EPB electric multiple-units, Nos. 5252 and 5355 respectively, constructed in 1957 and 1961. Neither unit at the time of the collision was fitted with AWS and thus the ground AWS fitted on the Down Fast line was unable to give any warning to the driver that he was about to pass Signal L271 at Danger.

13. At Bromley Junction the driver of the West Croydon to London Bridge train, 2K44, also passed Signal VC744 on the Up Crystal Palace Spur, protecting the junction, at Danger, having received a single Yellow aspect with a position 'J' junction indicator illuminated at the Norwood Junction Station Up Local Platform Starting Signal, JC95. He did not realise that he had passed the signal at Danger until, when closely approaching the junction, he saw that the points were set for a train coming from the Beckenham Junction direction. Despite making an immediate emergency brake application, he could not stop the train before it fouled the junction and the front of the leading coach came to rest some 15 ft. beyond the tips of the switch blades of the junction turnout.

14. The driver of the Beckenham Junction-Victoria train, 2R66, had a good view of his signal protecting the crossing, VC746, which was displaying a Green aspect and crossed the bridge over the London Bridge to Norwood Junction lines at between 30 and 35 mile/h. He then became aware that train 2K44 was nearing the Up line junction points although these points were set correctly for his train. He instantly closed the controller and made an emergency brake application in an effort to stop clear of the crossing, but was unable to do so and the front nearside coach of the train collided at approximately 15 mile/h with the leading coach of train 2K44.

15. The collision caused considerable damage to both trains. The leading coach of train 2K44 (unit 5007) was derailed all wheels, and the second coach had its leading bogie derailed and offside wheels of the trailing bogie lifted clear of the track, causing it to lean towards the nearside cess; all offside wheels of the third coach were also lifted from the track causing the vehicle to lean appreciably. Luckily no coach was turned onto its side which could have had serious consequences, as the track is on top of an embankment at this point. The two leading coaches of train 2R66 (unit 4725) were derailed all wheels but the Down Bromley line was not fouled.

16. The body and interior of coach No. 14014, the leading coach of unit 5007, were extensively damaged, as were those of the second coach, No. 15107. The body and interior of the leading coach of unit 4725, No. 12782, were also severely damaged. Other coaches on both trains sustained minor damage to bogies, underframes, bodies and interiors. The trains involved in the collision consisted of a 4-EPB electric multiple-unit, No. 5007, forming 2K44 and 4-SUB electric multiple-units Nos. 4725 and 4742, forming 2R66. None of the units at the time of the collision was fitted with AWS and thus the ground AWS fitted on both the Up Crystal Palace Spur and the Up Bromley line before Signals VC744 and VC746 respectively was unable to give any indication or warning to the drivers as they approached these signals.

#### *Damage to Permanent Way and Signalling Equipment*

17. The damage at Parks Bridge Junction was negligible, while that at Bromley Junction was restricted to bent stretcher bars and detection rods, together with a buckled switch rail and connections at No. 368 points, and associated permanent way and electrical components.

#### EVIDENCE—PARKS BRIDGE JUNCTION

18. *Driver R. W. Gillman* signed on at Dover at 05.00 and prepared the 06.12 empty stock train from Dover, Western Docks, to Dover Priory, where it formed the 06.18 train, 1G51, to Cannon Street via Chatham. The journey up from Dover was uneventful but, due to a number of signal checks, the train was running some four minutes late as it approached Parks Bridge Junction on the Up Fast line. Gillman said he received a single Yellow aspect at Signal L298 at Hither Green Station, followed by a similar aspect at Signal L292 and then a double Yellow aspect together with an illuminated junction indicator at Signal L288 to show that the train was being routed from the Up Fast to Up Slow line across the Down Fast line. Signal L278, the first signal beyond the junction on the Up Slow line, changed from a single Yellow to a Double Yellow as he approached it. Soon after passing this he noted a train running on the Down Fast line which appeared to have a door on the outer catch in the coach about two from the rear.

19. Gillman said that his train was brought to a stand by a signal at Danger on the London Bridge side of New Cross Station and, on going to the signal post telephone, he was informed by the signalman that his train had possibly been struck by another train. Training Inspector Bowman, who was travelling in the cab with him, told him that Guard Bailey had reported that the rear side of the rearmost cab had been struck by another train but that the damage was not severe and they could proceed under caution. They arrived at Cannon Street some 10 minutes late.

20. Gillman estimated that his train crossed from the Up Fast to the Up Slow line at Parks Bridge Junction at between 25 and 30 mile/h and did not notice anything unusual as his train traversed the junction. Although he noticed the train approaching the junction on the Down Fast line at a speed he estimated to be between 20 and 25 mile/h, he was unaware that it was unduly close to the junction, taking into account the fact that his own train was still crossing the line on which the other train was running.

21. *Motive Power Inspector G. R. Bowman* said that he regularly travelled in the cab of the 06.18 train from Dover Priory. He confirmed in general the evidence given by Driver Gillman. His main reason for noting the train on the Down Fast line approaching Parks Bridge Junction was Gillman drawing his attention to a door on the outer catch in one of the coaches to the rear of the train. Due to the curved nature of the junction it was extremely difficult to judge the speeds of other trains. He noted that when the front of their train was still on the crossover the other train was closely approaching Signal L271 at a speed he estimated to be between 15 and 20 mile/h.

22. *Guard V. C. Bailey*, the guard of train 1G51, travelling in the brake van of the middle unit, also confirmed the evidence of Driver Gillman. It was not until the train was passing through St Johns that a passenger informed him that something had hit the back of the train while it had been traversing Parks Bridge Junction. He made his way to the rear of the train and, seeing no damage in the passenger accommodation, he unlocked the door between the saloon and the cross-passage leading to the driver's cab where he found glass all over the floor and the nearside door swinging inwards. On examining the damage more closely he found that the two nearside handrails had been ripped off the bodyside at the top which he then secured. He informed Mr. Bowman over the loudophone what damage he had found and then told Driver Gillman when it was safe to proceed.

23. *Driver T. G. Hazzard* booked on duty at Slade Green at 06.19 on the day of the accident, working the 06.46 empty stock train to Dartford, where it formed the 06.56 train to Charing Cross via Sidecup. This in turn formed the 07.49 train, 2J04, from Charing Cross to Bromley North. After changing ends at Charing Cross, he carried out a satisfactory brake test with Guard Twell who had acted as his guard throughout the morning. He received Green aspects as far as St Johns and then had a double Yellow aspect at Signal L241 on the Down Fast line, a single Yellow aspect at Signal L263 and a Red aspect at Signal L267 which changed to a single Yellow aspect when he had brought the train nearly to a stand.

24. Hazzard said that he then proceeded towards Parks Bridge Junction, 470 yards beyond Signal L267, when he saw a main line train crossing from the Up Fast to the Up Slow line in front of him. He made an emergency brake application and released the driver's safety device, but the train continued towards the junction and the front nearside corner of his cab struck the rear nearside corner of the rearmost cab of the other train, luckily without causing any serious damage to or derailing either train. The train ran through the switch diamonds which were still set for the opposing route and came to rest with the head of the train on the Up Fast line facing in the Down direction approximately  $3\frac{1}{2}$  coach lengths beyond the switch diamonds.

25. Hazzard immediately contacted a signalman at London Bridge and reported that the head of his train was on the Up Fast line. Subsequently a motive power inspector and then the Station Manager from Lewisham, Mr. C. Smith, arrived at the site. After some discussion, he agreed reluctantly to drive the train at very slow speed in the wrong direction to the Up Fast platform at Hither Green Station to enable the passengers to be detrained.

26. While Hazzard could not say when he had previously worked a train over the Down Fast line from New Cross to Hither Green, he assured me that he was thoroughly satisfied that his route knowledge of the line was adequate. He could not remember previously working a train from Signal L263 to Signal L267, where the Red aspect has only cleared to a single Yellow aspect just before the train came to a stand. On questioning Hazzard why, up to this stage in his evidence, he had made no reference to Signal L271, the signal protecting the crossing on the Down Fast line, he freely admitted that he had missed sighting the signal and that it must have been displaying a Red aspect.

27. I asked Hazzard whether, after the train had come to a stand straddled across the Down and Up Fast lines, he had taken any action to protect his train or to get the guard to carry out the necessary protection: neither took any action other than speaking to the signalman on the telephone. Similarly

Hazzard took no action to ensure that he or Guard Twell checked that the passengers in the train were all right.

28. The leading unit of train 2J04 was EPB No. 5252 which was not fitted with AWS, although the line on which it was running was so fitted. Hazzard confirmed that he had been fully instructed in how to operate AWS and accepted that it had become mandatory to use it, when fitted, on 13th October 1980. He drove trains fitted with AWS over AWS fitted lines quite frequently, probably about 40 per cent of the time, and showed by the answers to my questions that he was thoroughly familiar with the method of operation of the equipment. He had no doubt that, had his unit been fitted with AWS, the audible warning given on the approach to Signal L271, showing a Red aspect, would have prevented him from missing the signal and enabled him to apply the brakes and bring the train to a stand before the signal.

29. Finally, I questioned Hazzard regarding his health and whether he had any family or personal problems, also whether he was taking any drugs at the time of the accident. He assured me that he was in good health, and was taking no drugs; he did not consider that there was any personal problem which could have caused him to fail seeing Signal L271 displaying a Red aspect.

30. *Guard P. L. Twell* was booked on the same turn of duty as Driver Hazzard and confirmed his evidence up until immediately prior to the accident. The first indication that anything was wrong was an emergency application of the brakes and the train coming to a sudden stop. Hazzard then told him on the loudaphone to telephone the signalman from Signal L271 to tell him that the train had been routed incorrectly. Twell said that the signalman told him he had already spoken to Hazzard and that Twell should rejoin him. Nothing was said by the signalman about the protection of the train, nor did Twell take any action to protect it, either by the use of track-circuit operating clips, or detonators, or both, although Twell agreed at my Inquiry that he should have protected the train.

31. Twell did not consider it necessary to check if the passengers were all right or to generally reassure them by going along the train, but he was instructed to do so by Mr. Smith, the Station Manager, Lewisham, as soon as he arrived on the site. During all his movements on or alongside the track, Twell failed to wear a high visibility jacket for his personal protection. Finally, Twell, despite using the telephone at Signal L271, was unable to tell me what aspect it was displaying.

32. *Signalman V. W. Cross* said that on the morning of the accident he was operating Panel No. 6 at London Bridge Signal Box which controls the Parks Bridge Junction area, the Mid Kent line and the country end of Lewisham. He noted that train 1G51 was running about four minutes late as it approached Parks Bridge Junction on the Up Fast line and that at the same time train 2J04 was approaching the junction on the Down Fast line. He set up the 'B' route from Signal L288 via switch diamonds Nos. 869 and points Nos. 867 and 873 to Signal L278 on the Up Slow line. He then set up the route for train 2J04 which necessitated the use of the reduced overlap facility on Signal L271. This included a severe approach control on Signal L267 nearly bringing the train to a stand before the aspect cleared from Red to a single Yellow to allow the train to proceed slowly up to Signal L271 with a Red aspect 204 yards before the junction.

33. Cross said that he observed on his track-circuit diagram train 1G51 passing across the junction and clearing No. 867 points but noted that YO track-circuit was still showing occupied. Almost immediately ZN track-circuit on the Up Fast line at No. 873 points became occupied and track-circuit YN, the berth track circuit to Signal L271 on the Down Fast line, became clear, although the train number 2J04 remained in the train describer berth at Signal L271. This suggested that train 2J04 has passed Signal L271 at Danger, proceeded onto the junction without a route being set and passed through the switch diamonds onto the Up Fast line in the Down direction.

34. Cross said that he immediately blocked the Up and Down Fast lines between Hither Green and New Cross and St Johns and Hither Green, also 'pegging' his Up Slow line with No. 871 points in 'reverse' to send all Up traffic via Lewisham. Train 1G51 was no longer on Cross's panel and so he requested his colleague on Panel No. 4 to stop the train and have it examined. Soon after, Driver Hazzard contacted Cross from the telephonic at Signal L257, informing him that the front part of his train was standing on the Up Fast line. The latter asked him what aspect he had had at Signal L271 and Hazzard stated "one Yellow". Cross then repeated the question and again Hazzard replied "one Yellow". Cross then told him to stay where he was and that under no circumstances was he to move his train.

35. In answer to my questions, Cross said that neither Driver Hazzard nor his guard stated that protection had been carried out or asked whether it should be, despite the fact that the train was fouling the junction with its head on the Up Fast line facing in the Down direction. Nor did Cross request either of the men to carry out the necessary protection; he considered that the action he had taken in blocking the lines on his panel provided adequate protection.

36. Cross was adamant that when he set the route for train 1G51 from Signal L288 on the Up Fast to Signal L278 on the Up Slow line he had noticed that the indications of Signals L267 and L271 on the Down Fast line were showing Red on his panel. This was the second time that morning that he had used the junction and he was satisfied that the signalling was functioning correctly.

37. *Area Signal Manager J. W. Dine*, on being informed of the accident, made his way to Parks Bridge Junction and supervised the testing of the signalling connected with the accident which was carried out by *Senior Technicians S. W. Charles* and *P. R. Ross*. The cables of Signals L267, L271 and L288 and of Points 869 were tested for earth and insulation, and no faults were found. The Red aspect in Signal L271 was correct as was the aspect sequence. The interlocking on 869 switch diamonds was tested and found to be correct. Finally, a series of complete functional tests were carried out in accordance with the Control Tables on Signals L267, L271, and L288; all routes were found to be operating correctly. Mr. Dine confirmed that the results of the tests carried out indicated beyond any doubt that, with a train routed from the Up Fast to the Up Slow across Parks Bridge Junction, there was no possible manner in which Signal L271 on the Down Fast could have been displaying anything other than a Red aspect.

38. Mr. Dine confirmed the significance of the description of train 2J04 remaining in the berth on the panel at Signal L271, despite the train itself going past the signal and occupying YO track circuit, namely that the route beyond Signal L271 was not set and that its aspect was Red. Mr. Dine also confirmed that as a train approaches Signal L267 with a restricted overlap to Signal L271 the former signal is approach controlled by YL track circuit, 158 yards before the signal, having to be occupied for 15 seconds before the signal clears from a Red to a single Yellow aspect.

39. *Senior Technicians Charles* and *Ross* confirmed Mr. Dine's evidence in all respects and, in addition, the latter stated that, after examining the switch diamonds which had been 'run through' by train 2J04, he refused the requests of the Traffic and Permanent Way Departments to operate by hand the clamp locks of 869A points to enable the train to be reversed onto the Down Fast line on grounds of safety, particularly taking into account the fact that there were still passengers in the train.

40. *Mr. C. Smith, the Station Manager, Lewisham*, proceeded to the site of the accident as quickly as possible. He found train 2J04 straddling switch diamonds 869 with the front three coaches on the Up Fast line facing in the Down direction, the fourth coach over the diamonds and the rear four coaches on the Down Fast line. After some discussion as to the best method of moving the train, he agreed with the London Bridge signalman that the train should be driven forward to Hither Green on the Up Fast line. Driver Hazzard was reluctant to do this, but Mr. Smith assured him that he would personally supervise the movement of the rear of the train off the switch diamonds and then, having got special permission for the 'wrong road' movement to Hither Green, he would accompany him in the cab. The movement was accomplished successfully.

#### EVIDENCE—BROMLEY JUNCTION

41. *Driver C. D. Brockhurst* signed on duty at Horsham at 05.30 after normal rest and feeling perfectly fit. He worked Class 405 units Nos. 4725 and 4742 from Horsham to Victoria after a satisfactory brake test and then the same stock from Victoria to Beckenham Junction after a further satisfactory brake test had been carried out at Victoria with Guard Parle. When returning with the 08.23 train 2K44, from Beckenham Junction towards Victoria, the stop at Birkbeck Station was quite normal and he received a green aspect at the Platform Starting Signal, CA243. Brockhurst said that, after receiving a green flag signal from Parle, he opened the motors to the series position in anticipation of slight slipping due to fallen leaves on the rails on the rising gradient to Bromley Junction; consequently his speed was slightly slower than usual.

42. Brockhurst said that he had a good view of Signal VC746, the signal protecting Bromley Junction on the Up Bromley line, and it was displaying a Green aspect. He particularly remembered this, as on every previous day that week that he had worked the 08.23 from Beckenham Junction, the signal had displayed a Red aspect. He estimated his speed on passing the signal as being between 30 and 35 mile/h. After he crossed the bridge over the London Bridge to Norwood Junction lines he saw another Up train, the 08.22 from West Croydon, closely approaching Bromley Junction but that the junction points, No. 368, were correctly set for the passage of his train. He immediately closed the controller and made an emergency application of the brake. When he realised that a collision was inevitable, he released the driver's safety device and, when satisfied that it had operated, moved to the offside of his cab immediately before the nearside of the cab collided with the offside of the leading coach of the other train. He estimated that the speed of his train at the moment of impact was about 15 mile/h.

43. Brockhurst said that he was unable to leave his cab as the nearside door was obstructed by train 2K44 and the offside cab door and the guard's communicating door had both jammed as a result of the

collision. He noted that Driver Marshall from train 2K44 applied a track-circuit operating clip on the Down Bromley line after which he came to Brockhurst's cab and learnt that the latter was trapped but unhurt. He said that Marshall, after ensuring that the guards of both trains were protecting the rear of their respective trains, obtained a crowbar from his own train and released him through the guard's compartment communicating door.

44. *Guard E. J. Parle* was riding in the guard's compartment in the fifth coach of train 2R66. He noted that Signal CA243 was displaying a Green aspect before he gave Driver Brockhurst a 'right away' signal with his green flag to leave Birkbeck Station. The progress of his train was normal until he was thrown forward by a fierce brake application, this was quickly followed by the impact of the collision.

45. Parle said that, on realising that an accident had occurred, he immediately alighted and placed a track-circuit operating clip on the adjacent Down Bromley line. He then went forward to the head of the train where he discovered that Brockhurst was unhurt but trapped in his cab. He checked with Driver Marshall that he would carry out full protection forward and his guard would protect the rear of train 2K44, and then made his way back along the Up Bromley line to carry out detonator protection at the rear of his train. On his return to the scene of the accident and having been assured by a member of the railway staff there that the traction current had been turned off, Parle assisted with the detraining of passengers from his train.

46. *Guard H. S. Dhanoa* booked on at Selhurst Depot at 06.11 and joined Driver Marshall to carry out both electro-pneumatic and Westinghouse air brake tests on Class 415 Unit 5007 before leaving to work the empty stock to Selhurst Station and thereafter working the 06.57 service to Holborn Viaduct, followed by the 07.35 to West Croydon. Dhanoa said that, after changing ends, they left West Croydon on time as train 2K44 for Victoria. He was riding in the rear guard's compartment and he clearly remembered noting that the Starting signal, JC95, at the London end of Norwood Junction Up Local Platform was displaying a proceed aspect together with a junction indicator for the Up Crystal Palace Spur, but he could not be certain what aspect. He did not see the Bromley Junction Signal, VC744, but, on approaching the junction, he felt what he thought was an emergency brake application being applied by his driver and then almost immediately he was thrown back in his compartment by the impact of the collision, slightly injuring his right arm.

47. Dhanoa observed that the train was on the Crystal Palace side of signal VC744 and that the front three coaches were derailed. On alighting from the train he started to make his way forward but Marshall, who was also on the trackside, saw him and signalled to him to go back. He therefore walked back to Signal VC744, which he checked was showing a Red aspect, telephoned the signalman, who confirmed both that the traction current was off and that protection had been given, and then put down three detonators, 20 yards apart, from the signal towards Bromley Junction. He then went back to his train to assist in detraining the passengers and conducting them along the trackside to Crystal Palace Station.

48. I questioned Dhanoa at some length concerning Driver Marshall. He considered Marshall had been behaving perfectly normally during his driving of the various trains that morning and he did not notice anything unusual when they met whilst changing ends at West Croydon prior to working train 2K44. Marshall did not discuss any personal problem with him nor, after the collision, did he comment on the aspect being displayed in Signal VC744 as the train approached and passed it.

49. *Driver N. A. Marshall* confirmed that he had booked on duty at Selhurst Depot at 06.26 on Friday, 13th November, having booked off duty at 13.00 the previous day. He considered that he was fit to drive but admitted he had a lot of personal and domestic problems at the time. He was due to collect his wife and newly born first child from hospital later in the day, the baby having been delivered with difficulty on 7th November. He had been visiting his wife in hospital each evening and not getting to bed until about 10.30 each night. In addition, his mother was very ill in Bournemouth and he had received telephone calls from his father each evening to let him know her condition.

50. On the night before the accident Marshall said he went to bed at 23.00, but had a poor night's sleep as he was suffering from a mild migraine and also had a wisdom tooth that was troubling him. When he got up at 04.45 on the Friday morning he took two 'Equagesic' tablets to help get rid of his migraine—he had been prescribed these over a year previously by his doctor for his intermittent migraine attacks and still had a small number left. Marshall said that his doctor did not issue any warning when he prescribed the tablets, but equally he had not informed his doctor that he was a train driver. At about 07.30, whilst at Holborn Viaduct, he took two more 'Equagesic' tablets and then at about 08.20, at West Croydon, he used some 'Superdrug Toothache Solution' mouth wash to relieve his toothache; he subsequently discovered that this solution contained 0.5 per cent chloroform.

51. Marshall was adamant that, despite his personal worries, his lack of sleep and the medicines that he took, he felt all right and quite capable of driving competently. The driving of the trains from

leaving Selhurst Depot until arriving at West Croydon, as described by Guard Dhanoa, were, in his opinion, quite normal and without incident. He left West Croydon with train 2K44 on time at 08.22 and also left Norwood Junction Up Local Platform on time with the Starting Signal, JC95, clearly displaying a single Yellow aspect with a position '1' junction indicator. Marshall said he passed through JC93 junction points onto the Up Crystal Palace Spur leading to Bromley Junction at about 20 mile/h, shutting off power at the normal position for sighting Signal VC744 which he expected to find displaying a Red aspect to protect the junction whilst the 08.23 Beckenham Junction to Victoria train, 2R66, preceded him to Crystal Palace, as booked in the working timetable. Marshall said that he was satisfied that when the signal came into his view it was displaying a single Yellow aspect and thus he reopened his controller to accelerate the train up to the maximum permitted speed of 20 mile/h through No. 368 points at Bromley Junction.

52. On closely approaching the junction, Marshall observed that No. 368 points were set for a train from Beckenham Junction and he immediately realised that he must have passed Signal VC744 at Red. He immediately released the Driver's Safety Device in order to make a full emergency brake application with the minimum delay but failed to bring the train to a stand until his cab was just short of the switchblades of the junction points. Almost immediately Marshall felt his train surge forwards, his coach tipping towards the nearside cess and coming to a halt still leaning over.

53. Marshall said that, on seeing that a collision had occurred, he promptly applied a track circuit operating clip to the Down Bromley line, which appeared to be fouled and telephoned the signalman at Victoria Signal Box to inform him of the collision, request the isolation of the traction current on all lines and ask for the emergency services to be called. He then arranged for the two guards to carry out protection in rear of their trains and, seeing that passengers were getting out of his train, he telephoned the signalman again to confirm that the current had been isolated.

54. I questioned Marshall at length as to why he had passed signal VC744 at Red which he readily accepted he must have done, but he was unable to produce a definite answer. He agreed that his personal problems were tending to distract his concentration and that he might have retained the sight of Signal JC95 showing a single Yellow aspect in his mind. He was quite satisfied that the fact that he was using his sun visor and that the sun was tending to shine from behind him into the lenses of the signal did not cause him to mistake the aspect. In particular, had the sun caused a 'phantom' and more than one aspect appeared to be illuminated he would have immediately stopped and telephoned the signalman. The only effect of the sun could have been to have caused the Red aspect to appear less brilliant than at other times. At the time of the accident he thought he was thoroughly alert and in full control of his train, but he now accepted that this could not have been the case, although he was unable to say why this was so.

55. I also questioned Marshall as to whether, in his opinion, the provision of AWS (Unit 5007 was not fitted, but the ground equipment at Signal VC744 was operational), had it been available, would have alerted him and prevented him passing the signal at Danger. He accepted that AWS, which he was using for about 25 per cent of his driving hours at the time of the accident, was in general of positive assistance to the driver. Had his unit been fitted with AWS, however, whether the signal was displaying a single Yellow aspect or a Red aspect, he would have received the same warning, namely a horn and a black indication turning to a yellow and black indication on the depression of the cancellation button. He found it difficult to say whether he would have examined the aspect of VC744 more closely and possibly discovered his mistake or, being under the impression that it was displaying a single Yellow aspect, he would have cancelled the AWS without looking further at the signal.

56. I questioned Marshall further about his taking of the 'Equagesic' tablets. He said he was unaware that when the instructions on a medicine bottle stated "2 Tablets, 3 or 4 times a day" it meant that the maximum dose should be two tablets every six hours and thus he had taken double the prescribed dose on the morning of the accident. He said that on previous occasions he had taken a similar dose without any ill effects. Marshall said that he was aware of Section A, Clause 1.2.2. of the Rule Book dealing with the taking of intoxicating liquor or drugs whilst on duty but he did not drink nor did he consider that 'Equagesic' tablets came under the class of drugs referred to in the rule. Marshall said that he had not seen the "Drink and Drugs—not a good mixture. Have no doubts, Ask your Doctor" poster, nor the similar pamphlet issued by the Safety Advisory Service, until after the accident. To the best of his knowledge the poster appeared in all Mess Rooms on about 26th November 1981. Finally, Marshall said he had been back to see his doctor since the accident and the latter had said that, if he had been told that Marshall was a locomotive driver, he would have informed him of the effects of the tablets.

57. Dr. M. J. Andrews, the Senior Medical Officer, Southern Region, said that he had investigated the medical aspects of Driver Marshall's case with particular reference to his taking 'Equagesic' tablets prior to the accident. On the manufacturer's data sheet, which is the standard method of advising the medical profession on the prescribing of various drugs, it is stated "This product rarely causes drowsiness but patients receiving this medication should not drive or operate machinery unless the drug has been

shown not to interfere with physical or mental ability". Doctors prescribing such drugs in many cases, however, did not either warn the patient verbally or request the pharmacist to place a written warning on the bottle containing the drug.

58. Dr. Andrews stated that the effect of a person taking four tablets within about 3 hours, twice the prescribed dose, could vary from no side effect at all to obvious drowsiness. As far as Marshall was concerned the drug would have had an enhanced effect on him of which he would not have been subjectively aware, due to his very short night and the fact that he slept badly. Marshall's state of health was normal when Dr. Andrews examined him, as was his visual acuity and colour vision.

59. *Signalman G. F. W. Twilley* was on duty on No. 3 panel controlling the Bromley Junction area of the new Victoria Signal Box on the morning of the accident. He gave preference to the 08.23 train from Beckenham Junction over Bromley Junction, as shown in the Working Timetable, and set the route from Signal VC746 to VC742, noting that the indication for Signal VC744 remained Red. Shortly after he noted that No. 368 points were indicating that they were out of correspondence and almost immediately he was telephoned from Signal VC744 to be told that a collision had occurred, whereupon he immediately sent the 'emergency alarm' signal to Norwood Junction Signal Box. Shortly after he was telephoned from the telephone at No. 368 points, told that there had been a collision and requested to summon the emergency services; he immediately sent the emergency alarm to Beckenham Junction and the regulator called the emergency services. He protected the area of the collision by replacing all protecting signals to Red and using reminder appliances.

60. Twilley confirmed that he and not Signalman Taylor, who was supervising his duties, had set the route for train 2R66 from Signal VC746 to Signal VC742 and that neither he nor Taylor had previously set the route from Signal VC744 to Signal VC742 for train 2K44 and then changed their minds. He pointed out had they done so, Signals VC744 and VC746 would have been held at Danger for two minutes before the other route could have been set.

61. *Signalman I. J. R. Taylor* confirmed that he was supervising Twilley on panel No. 3 in Victoria Signal Box on the morning of the accident and, in general, confirmed Twilley's evidence. Taylor said that, immediately after the accident, Selhurst Electrical Control telephoned to advise them that there was a dead short in the Crystal Palace area, was informed that there had been a collision and the controller in turn confirmed that he had discharged all current in the Crystal Palace-Bromley Junction area.

62. Before the collision the signalling equipment in the Bromley Junction area had been working satisfactorily and Signals VC744 and 746 had been operated manually and not in the automatic mode. Taylor was also emphatic that the route had been set for train 2R66 between Signals VC746 and VC742 in accordance with the Working Timetable and that at no time immediately prior to the accident had the route been set from Signal VC744, cancelled, and then altered.

63. *Mr. C. S. French, the head of the Rules and General Section, South Eastern Division*, was travelling from West Croydon to London Bridge in train 2K44 on the morning of the accident. He was seated next to the window, facing forward on the nearside of the first compartment of the leading coach and, after a steady run up the bank from Norwood Junction, as if the driver had the route clear for him through Bromley Junction, he saw Signal VC744, showing a Red aspect from shortly before or just as the driver's cab passed it. Almost immediately there was a grinding noise and the train came to a halt with his coach leaning over towards the cess. After discovering that a collision had occurred, he obtained confirmation from Victoria Signal Box that the traction current had been isolated and then assisted in the detraining of passengers until the emergency services arrived.

64. *Signal and Telecommunications Supervisor L. D. Bond*, on being told of the collision, went direct to the Crystal Palace Relay Room, arriving there at about 09.40. He checked No. 368 point relay, finding it was in the 'normal' position, and then proceeded to Bromley Junction to inspect the S&T equipment and assess the damage to it. He examined No. 368 points on the ground and found that the right hand switch, which should be closed when the points are set 'normal', had been run through, although the facing point lock in the point machine was still intact. The stretcher bars and other connections were bent, and he was able to see clearly where the wheels of the train coming up the Crystal Palace Up Spur had scraped metal off the switch blade and distorted it from the closed position. He checked Signal VC744 and found it was displaying a Red aspect; in his opinion its brilliance was what one would normally expect and was not affected by the sunlight.

65. Later Bond tested the cables leading to Signals VC744 and VC746 and found that these were satisfactory in all respects. The next morning he checked the aspect sequences between Signals JC95 and VC744 and found that they were correct in accordance with the control table.

66. *Technician Officer P. J. Scott* was called to the operating floor of the Victoria Signal Box when the accident occurred and noted all the indications on the panel in the Bromley Junction area. Of

particular significance, No. 368 points were indicated as 'out of correspondence', and the route indication lights of the short section of track circuit between Signal VC744 and the points were not illuminated. Both these indicated that the route through Bromley Junction had been set for train 2R66 on the Up Bromley line and not set for train 2K44 from Norwood Junction up the Crystal Palace Spur. Further confirmation of this and the fact that train 2K44 had passed Signal VC744 at Danger was given since the description of 2K44 was still in the berth track of Signal VC744 while that for 2R66 was in the berth track of Signal VC742, having advanced beyond the junction.

67. *Mr. R. Remnant*, the *New Works Assistant* associated with the commissioning of the new Victoria Signal Box and *Mr. P. H. J. Green*, the *Assistant Divisional Signal Engineer, Central Division*, had collaborated in carrying out a series of additional tests of the signalling, the former in the signal box and the latter in Crystal Palace Relay Room. The tests had to be carried out in this manner because trains were running into Crystal Palace Station and thus it was virtually impossible to carry out tests purely on the local panel. The main testing was to prove that the approach locking on Signals VC744 and VC746 was correct and that the approach locking and route holding on No. 368 points was correct. Mr. Green confirmed that, from the results of the tests carried out by him or on his behalf, the signalling at the time of the accident was functioning correctly and that Signal VC744 was displaying a Red aspect when passed by train 2K44.

68. Mr. Remnant explained that he was responsible for testing the interlockings from the panel in the signal box as each interlocking, housed in a relay room, was commissioned. With the Crystal Palace commissioning on 9th August 1981 there had been one or two minor faults, but the two routes involved in the accident, from Signal VC744 to Signal VC742 and from Signal VC746 to Signal VC742, had been completely trouble free. He was not aware of any faults in the area between then and the accident apart from one instance of a high resistance contact in the Signal VC744 circuit in the relay room—a safe side failure.

69. Mr. Remnant pointed out that among the tests which were carried out following the accident was the lamp and controls feature between Signal VC744 and Signal JC95. The control is such that Signal JC95 will only clear if there is a Red aspect showing in Signal VC744 or if the route ahead of the latter signal has been set. This control was found to be correct and this gave further proof, as the route ahead was not set, that Signal VC744 was passed by train 2K44 when it was displaying a Red aspect.

#### CONCLUSIONS

70. The direct cause of these two collisions was the passing of the signals protecting Parks Bridge and Bromley Junctions respectively at Danger.

71. The reason why Driver Hazzard passed Signal L271 at Danger, having brought his train nearly to a stand at the previous signal, L267, which then cleared to a single Yellow aspect under approach control, is hard to understand. He freely admitted that he had missed sighting the signal, although he considered that his route knowledge of the line was adequate and that the conspicuity of the signal, which he passed at a comparatively low speed, was perfectly acceptable. He assured me that he was in good health and that he had no personal problems which might have momentarily distracted him from concentrating on his driving duties and cause him to pass Signal L271 displaying a Red aspect. Together with the Railway Officers, I examined the sighting of Signals L267 and L271 under similar conditions to those experienced by Driver Hazzard and am thoroughly satisfied that both signals were adequately brilliant and conspicuous; I was unable to find any physical reason why a driver should miss seeing signal L271 when displaying a Red aspect.

72. One must take into account, however, the fact that the leading unit of Hazzard's train, 4-EPB No. 5252, at the time of the accident was not fitted with AWS, although the line on which it was running was fitted. Thus he received no audible or visible warning in his cab that Signal L271 was displaying a restrictive aspect. The use of AWS in the South Eastern Division of the Southern Region, where it was fitted, had been compulsory since 13th October 1980 and Hazzard considered that he was driving trains fitted with AWS over AWS-fitted lines about 40 per cent of the time; there was no doubt that he was accustomed to using it and conversant with its method of operation. Hazzard, although appreciating that AWS was essentially an aid to a train driver and in no way relieved him of his responsibility of observing and obeying signals, had no hesitation that, had his unit been fitted, the warning given by the AWS would have prevented him from missing the signal and have enabled him to apply the brakes and bring the train to a stand before reaching Signal L271. I accept Hazzard's conclusion.

73. The reason why Driver Marshall drove past Signal VC744 at Danger is, in my opinion, more easy to explain. He was short of sleep, having only gone to bed at 23.00 the previous evening and having got up at 04.45 after a poor night's sleep resulting from a mild migraine and a wisdom tooth that was

troubling him. He then proceeded to take two 'Equagesic' tablets twice in under three hours, double the dose prescribed by his doctor, and, in addition, he had considerable personal and domestic problems. His mother was seriously ill in hospital and his wife and newly born first child, which had been born with complications on 7th November, were due to be collected from hospital later in the day. I have little doubt that the combination of worries, lack of sleep and an overdose of an analgesic-cum-tranquiliser medical drug, albeit a mild one, was sufficient to reduce his normal state of alertness so that he was unaware that he was passing Signal VC744 at Danger. As stated by Dr. Andrews, the fact that Marshall considered at the time that the drugs had had no effect on his alertness is no indication of his real state, as they might well have had an effect of which he would not have been subjectively aware.

74. The situation as regards AWS was similar to that of Driver Hazzard at Parks Bridge Junction, namely the unit which Marshall was driving, EPB No. 5007, was not fitted with AWS, although the line on which it was running and, in particular, Signal VC744 was fitted. Marshall was not sure that the AWS, if operating, would have alerted him that he was approaching the signal at Red. He said he was under the impression that the signal was displaying a single Yellow aspect and thus he might have reset the AWS without looking further at the signal, as the warning of a horn and the visual indication of a black and yellow aspect, on his pressing the acknowledgement (cancellation) button, was the same for both Yellow and Red signal aspects. Obviously it is not possible to prove that, had AWS been operational on the line concerned, Marshall would not have passed Signal VC744 at Danger, but I firmly believe it might have.

#### REMARKS AND RECOMMENDATIONS

##### *The Automatic Warning System*

75. These two accidents must join the list of other accidents on the Southern Region which would in all probability have been avoided had the signals and trains concerned been fitted with AWS. The subject of AWS on the Southern Region, or rather the delay in fitting it, has been dealt with by several Inspecting Officers in their Reports of Inquiries into collisions on the Southern, the last of which was by Major C. F. Rose in his Report on the collision that occurred on 19th December 1978 between Hassocks and Preston Park\*, where he set out the history of AWS on the Region up to the end of 1978. I do not need to reiterate the background up to 1978, but to briefly set out the current position.

76. Of the 850 route miles remaining to be fitted with AWS track equipment at the end of 1978, 652 route miles have been fitted or will be fitted within the next two years. This will still leave 198 route miles to be completed and I am assured by the British Railways Board that a high priority is being given to completing this, despite the current financial limitations with which they are having to contend. While Major Rose recorded that the full planned provision of AWS would be achieved by 1985, the situation at the time of writing this Report is that all the routes on the Region, due to be fitted with AWS in accordance with the Board's signalling principles, will be fitted by the end of 1986 with the exception of the Paddock Wood to Strood line (21 route miles) and the Ashford to Minster line (26 route miles) which will be completed in 1987. While this represents a slippage in the programme agreed with Major Rose, I am satisfied that the programme I have outlined above represents the best possible one that can now be achieved and that all the Chief Officers at the Board and in the Southern Region fully appreciate the vital importance of ensuring that no more delays occur.

77. As is illustrated by this Report, the AWS problem is not only confined to the track equipment but also to the fitting of the train-borne equipment including the audible and visual warnings in the cab. I am assured by the Chief Mechanical and Electrical Engineer of the Southern Region that the fitting of this equipment is well up to schedule and all locomotives, DMU, DEMU and EMU to be retained in service beyond the end of 1985 will have been fitted before that date. While I have no reason to question this statement, which was given in good faith, I consider it essential, in the event of any serious delays in the withdrawal of older classes of rolling stock from service beyond the end of 1985, that such stock should also be fitted with AWS. With all drivers relying increasingly on the assistance given by AWS, it would be even more dangerous than in the past for drivers to be denied the use of this important safety aid when it was in use virtually universally.

##### *Dangers from Alcohol and Medical Drugs*

78. Following my Inquiry into the collision that occurred at Chinley North Junction†, in the London Midland Region, on 14th February 1978, I recommended that the leaflet, issued originally in 1975, warning train crews and other operational railway staff of the dangers of mixing alcohol and medical

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\*HMSO ISBN 0 11 550520 2

†HMSO ISBN 0 11 550560 1

drugs, also the necessity of informing one's doctor of one's job if drugs were being prescribed, should be re-issued forthwith and thereafter at regular intervals and to all new recruits on entering railway service. This pamphlet was re-issued throughout British Railways, with the exception of the Southern Region, in 1980. I have been unable to discover why no action was taken by the Region to re-issue the pamphlet in accordance with the instructions of the then Director, Industrial Relations, British Railways Board. I am glad to state, however, that immediately after the Bromley Junction collision the leaflet was re-issued to all the appropriate staff on the Southern Region and I was assured that reminders would in future be issued at two yearly intervals. I strongly recommend, particularly with the current reorganisation within British Railways that steps be taken both at Board and Regional level to ensure that the dangers from alcohol and medical drugs are drawn to the attention of all appropriate staff at regular two yearly intervals.

I have the honour to be,

Sir,

Your obedient Servant

P. M. OLVER

*Major*

The Permanent Secretary,  
Department of Transport

# COLLISION AT PARKS BRIDGE JUNCTION, SOUTHERN REGION, ON 18<sup>th</sup> AUG. 1981

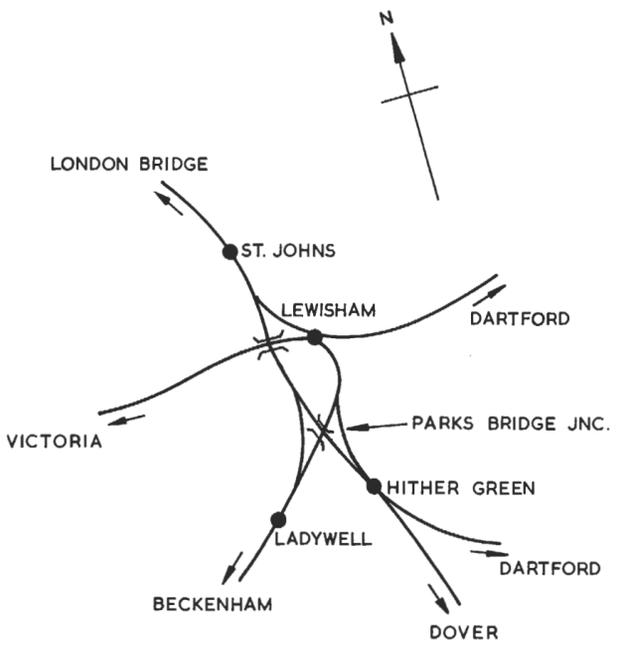
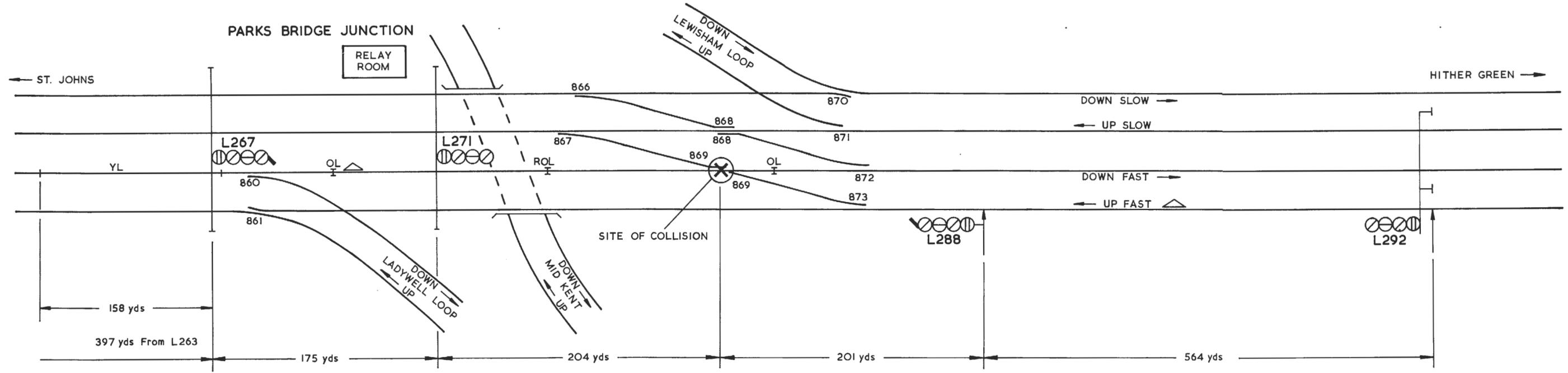


Fig. 2 LOCATION DIAGRAM

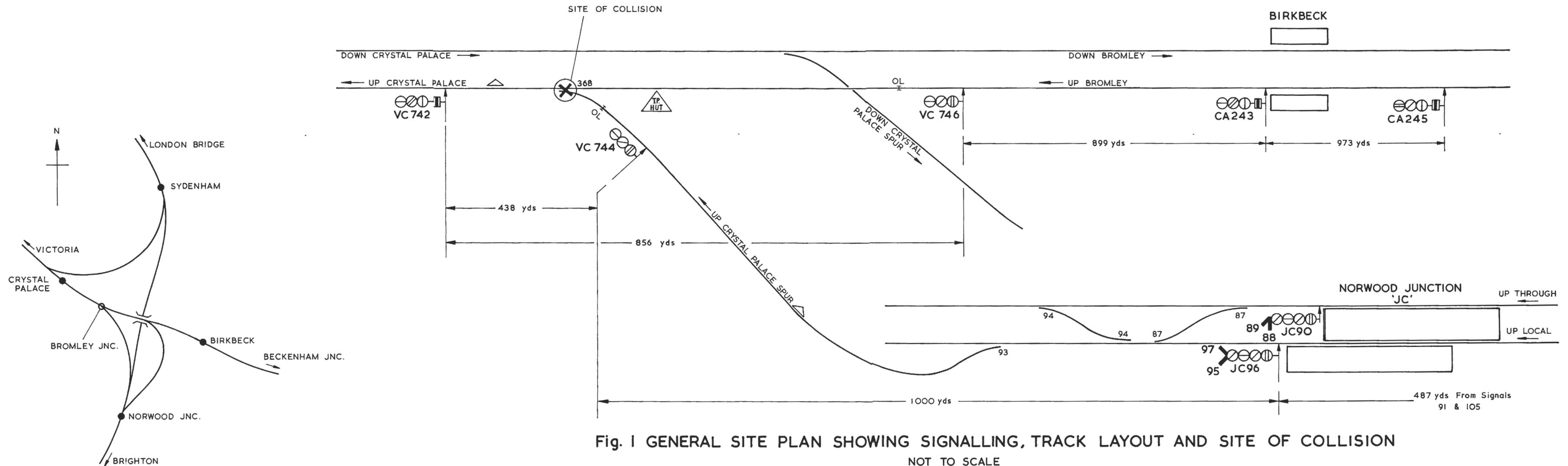


SIGNALS CONTROLLED FROM LONDON BRIDGE (L)

Fig. 1 GENERAL SITE PLAN SHOWING SIGNALLING, TRACK LAYOUT AND SITE OF COLLISION

NOT TO SCALE. ONLY RELEVANT SIGNALS ARE SHOWN

# COLLISION AT BROMLEY JUNCTION, SOUTHERN REGION, ON 13<sup>th</sup> NOV. 1981



**Fig. 2 LOCATION DIAGRAM**