



DEPARTMENT OF THE ENVIRONMENT

# RAILWAY ACCIDENT

**Report on the Collision that  
occurred on 16th December 1972  
at Copyhold Junction  
near Haywards Heath**

IN THE  
SOUTHERN REGION  
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE  
1974

PRICE 41p NET

# RAILWAY ACCIDENT

Report on the Collision that  
occurred on 16th December 1972  
at Copyhold Junction  
near Haywards Heath

IN THE  
SOUTHERN REGION  
BRITISH RAILWAYS

SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Order dated 18th December 1972, the result of my Inquiry into the collision between two passenger trains that occurred at about 22.00 on Saturday, 16th December, 1972, at Copyhold Junction near Haywards Heath in the Southern Region of British Railways.

In patchy fog the 21.28 electric multiple-unit (EMU) stopping passenger train from Brighton to Victoria, formed of 8 coaches, having passed at Danger the signal on the Up Local line protecting the converging junction with the Up Through line, was on the junction points when it was struck at the sixth vehicle by the 12-coach 21.45 Brighton to Victoria EMU express passenger train running under clear signals on the Up Through line.

The leading 4 coaches of the stopping train remained on the track but the rear 4 coaches became uncoupled, and were derailed and badly damaged. The first 10 coaches of the express train were derailed and 3 were badly damaged.

The derailment blocked all lines and the traction current was discharged automatically as a result of the collision. Fortunately both trains were very lightly loaded and there were no fatal casualties, but 11 passengers were treated for shock and minor injuries and two were detained in hospital for one and two nights respectively.

During the period of blockage there was considerable disruption of traffic and London-Brighton services were diverted via the Mid-Sussex line. Owing to the difficulty of access to the site, which lies in a steep sided cutting, clearance of the damaged vehicles and restoration of the track was not easy and the line was not reopened until 19th December, with the connections between both Up and Down Local and Through lines temporarily replaced with plain line. New high-speed turnouts had to be specially fabricated and the Down side connections were not restored until 14th January 1973 and the Up side connections one week later.

#### DESCRIPTION

##### *Site and Signalling*

1. Copyhold Junction, where the former branch line to Horsted Keynes, now a siding serving a quarry at Ardingly, joins the Victoria-Brighton Main line on the Down side, lies  $1\frac{1}{4}$  miles north of Haywards Heath. Between Haywards Heath station, which has 2 island platforms, and Copyhold Junction the line is 4-tracked with Up and Down Local lines flanking the Through lines. With the exception of the branch, all lines are electrified on the conductor rail system at 750v DC. At the junction the four tracks merge into two for the double track section across the Ouse Viaduct and through Balcombe Tunnel. The line speed on the Up and Down Through lines is 90 miles/h and on the Local lines and through the connections between the latter and the Through lines at Copyhold Junction, 60 miles/h.

2. The gradient is rising in the Up direction generally at 1 in 264, from south of Haywards Heath to a summit at Balcombe Tunnel. At Copyhold Junction the line lies in a deep steep-sided cutting and, just at the point where the double track section begins, it is spanned by a substantial brick 2-arch bridge, the centre pier of which stands between the Down Main line and the Ardingly siding, which at this point is just starting to diverge eastwards from the Main line.

3. The signalling in the area is on the Track Circuit Block system with colour-light running signals, installed in 1932, since when the points and signals at Copyhold Junction have been controlled electrically from Haywards Heath. Train description is by means of magazine type train describers. The signal box at Haywards Heath, located on the Up side of the line, contains a 60-lever frame with full mechanical interlocking between the levers, some of which operate points and signals mechanically and others, as at Copyhold Junction, by electrical means. Above each of the levers controlling the colour-light running signals multiple-aspect indicators are provided, displaying the actual aspect of the signal regardless of the position of the lever. Above the lever frame is a point and signal diagram of the layout with track circuit occupation shown by the illumination of two bulbs in an oval display for each separate track circuit, located and numbered appropriately.

4. Those points and signals relevant to the accident are shown on the drawing attached to this Report. On the approach to Haywards Heath from the South, the first controlled signal, CH 1/2, is a combined junction home signal with R/Y aspects, controlled by lever No. 1, reading to the Up Local line and R/Y/G aspects, controlled by lever No. 2, reading to the Up Through line. It is located on the approach to Haywards Heath tunnel, 648 yards in rear of No. 5 facing points where the Up Local line diverges from the Up Through

line and 1,070 yards in rear of Signals CH8 and CH19, the 3-aspect platform starting signals on the Up Local and Up Through lines respectively. The 3-aspect signals protecting No. 16 points, where the Up Local and Up Through lines merge at Copyhold Junction, are CH13 and CH20 respectively located 1,453 yards in advance of the platform Starting signals and 659 yards in rear of the points at Copyhold Junction. Both signals CH13 and CH20 are provided with a combined berth and overlap track circuit, the overlap lengths being 386 and 388 yards respectively. Beyond these overlaps, a common track circuit extends to beyond No. 16 points.

5. The gantry that supports Signals CH13 and CH20 stands on the left of the Up Local line with CH13 located on the supporting mast, 6 ft 4 ins from the running edge of the nearest rail, with the red aspect 11 ft 7½ ins above the rail level of the Up Local line. Signal CH20 is located on a cantilever arm 5 ft 4 ins to the left of the left hand running rail of the Up Through line and with the red aspect 16 ft 6 ins above rail level. From the Up Local line, on account of a gentle left hand curve, the Up Through line Signal CH20 comes into view first, at a distance of 572 yards, followed by CH13 at 528 yards. A continuous full view of both signals is obtained from the Up Local line over a distance of 506 yards.

#### *The Trains*

6. The 21.28 stopping train from Brighton to Victoria was formed of two 4-VEP through corridor semi-fast electric multiple units. Its overall length was 531 ft and its tare weight 294 tons.

7. The 21.45 Fast train from Brighton to Victoria consisted of three 4-car express units, the leading and trailing units being of the 4-CIG type with a 4-BIG (Buffet) unit marshalled between them. Its overall length was 796 ft and its tare weight 456 tons.

8. All the units of both trains were of a similar layout, each comprising two driving trailers with a non-driving motor brake second and a trailer car marshalled between them. All were of modern all-steel construction with buckeye couplings and Pullman-type gangways throughout and were fitted with both electro-pneumatic and Westinghouse automatic air brakes. Their maximum service speed was 90 miles/h. They were all built at York works at various dates between 1966 and 1971.

#### *The Course of the Accident and Damage caused*

9. The actual point of collision, the fouling point where the Up Local line merged with the Up Through line at Copyhold Junction, lay 561 yards beyond Signals CH13 and CH20 and the initial contact was between the grab rail outside the driving cab of the Fast train and the side panelling in the area of the guard's compartment on the sixth coach of the Slow train. The marks of this contact indicated that the speed of the Fast train was only slightly higher than that of the Slow train at the moment of collision and the immediate result was that the leading driving trailer of the Fast train rolled over onto its right side, glanced off the centre pier of Copyhold Lane bridge and came to rest on the Down Main line about 80 yards beyond the bridge and separated by a coach length from the rest of the train, which was derailed all but the last 2 vehicles. The Slow train became divided between the 2 units, the leading 4 coaches being completely undamaged and coming to rest 250 yards beyond the bridge. The rear 4 coaches were all derailed towards the cutting side leaning over at an angle of about 45° with the fifth coach only a few feet from the brick abutment of the bridge.

10. The most extensive damage was to the underframes of the middle unit of the Fast train and to the rear unit of the Slow train, the bodies of which were pushed off their bogies. The degree of damage to the bodies was comparatively slight, most being caused by the detached bogies being carried along in the space between the two trains.

11. The damage to the permanent way and signalling equipment was severe. Both the connections between the Through and Local lines were demolished together with over 300 yards of plain track. The point machines were destroyed and the main lineside signalling and telecommunications cables severed, thus cutting off power supplies to Haywards Heath signal box. The traction current was also discharged automatically as a result of the collision.

#### *Operating Instructions*

12. When both the Slow and Fast Brighton-Victoria trains are running on time, the former is booked to leave Haywards Heath at 52½ minutes past the hour and precede the latter through the double track section from Copyhold Junction to Balcombe Tunnel Junction, the actual booked passing times at Copyhold Junction being 0.55 and 0.00 respectively. However, since the maintenance of the service depends on the Fast train being given as far as possible a clear run, the following special instruction was issued after the introduction of the present service pattern in the new timetable that came into force in July 1967.

##### *0.28 Brighton to Victoria*

'The 0.28 Brighton to Victoria should be run to the Up Local Platform at Haywards Heath as a regular practice. If it leaves Haywards Heath 3 or more minutes late and the 0.45 Brighton is running to time, the 0.28 must follow the 0.45 from Copyhold Junction. These arrangements to apply off peak weekdays, all day Saturdays and Sundays as applicable.'

## EVIDENCE

13. *Relief Signalman J. E. R. Budd* assumed duty at Haywards Heath at 21.25. He told me that the 21.28 Brighton to Victoria was described to him from Keymer Crossing at 21.48 and he routed it into the Up Local platform where it arrived at 21.53, 3 minutes late. It was still standing in the station at 21.55 when the 21.45 Brighton to Victoria was described from Keymer Crossing and Signalman Budd decided to give the latter train preference. The points at Copyhold Junction were already set for the Up Through line, and the Up Local Starting signal (CH8) was showing Yellow with the repeater for Signal CH13 showing Red. As he cleared the Up Through signals for the Fast train the Slow train started away from the station and he restored CH8 as soon as the train passed the signal. Perhaps a minute later the Fast train emerged from the tunnel and whistled as it approached the station. Signalman Budd described it forward to Balcombe Tunnel Junction and replaced Signal CH2 and CH19 behind it. He then remained standing at the frame ready to replace CH20 lever after the Fast train had cleared Copyhold Junction and saw Track Circuit 18, covering the junction, show occupied about a minute after the train had passed the station. This he assumed to be the head of the Fast train passing the block joint at the overlap of Signal CH20. However, an instant before all his indications were lost he saw the berth track circuit for Signal CH13 show clear, indicating that the Slow train had passed beyond the overlap of that signal. Realising at once that it was almost certain a collision had occurred he sent the 'Obstruction Danger' signal to Balcombe Tunnel Junction and operated the emergency replacement switch for Signal CA16 on the Down line. He then called out the Emergency Services. His first actual confirmation that an accident had occurred was not until one of the permanent way men travelling on the Slow train went back to Signal CH13 and telephoned him from there.

14. In charge of the Fast train was *Guard J. P. Farrell* stationed at Brighton. He had taken over the train at Brighton at 21.30 and it had left on time at 21.45. He told me that he was on his way to the rear of the train to carry out his duties as train ticket collector as the train passed through Haywards Heath, which he noted as being passed on time, and soon afterwards felt the brakes being applied in emergency. He started at once to return to his brake compartment but within about 5 seconds he felt the train make 3 lurches and the coach started to lean over, coming to a stand with all the lights out.

15. Guard Farrell went immediately to his brake compartment, collected his detonators and was about to set out to protect in rear when he met a permanent way man who undertook to protect the train while he got out an extinguisher to deal with a small fire that had broken out underneath one of the rear coaches of the other train. He then handed the extinguisher over to the guard of the other train and then got out some more detonators and went forward to protect the Down line. On the way he met another permanent way man who told him that the driver was unhurt and was carrying out the protection, so he went back to Signal CH13 where he spoke on the telephone to the signalman and asked for the Fire Brigade and Ambulances to be sent to the scene. He then noticed that the visibility seemed to have worsened so he put down additional detonators, one on each Up line 100 yards behind the two trains and then went back the full mile to put 3 more detonators on each line.

16. The driver of the Fast train was *Driver E. Rooke*, who took the train over at Brighton at about 21.35, after his mid-shift break. He told me that he had had clear signals until after passing Wivelsfield where he first saw a Yellow signal. He made a slight application of the brake but the signal cleared to Green before the train had lost any significant amount of speed. He recalled that he then ran into an area of patchy fog and the next signal, which was the junction signal for the Up Local line at Haywards Heath, cleared from Yellow to Green for the Up Through line almost as it came into view. The next two signals, the Haywards Heath Up Through Starting signal and the signal protecting the convergence of the Up Through and Up Local lines at Copyhold Junction were both at Green, but just after passing the latter Driver Rooke suddenly saw the illuminated red screens of a train on the Up Local line close ahead. Realising that a collision was inevitable, he made an emergency brake application, let go of the controller and crossed to the off side of the cab where he clung to the handbrake column and waited for the impact. He thought the speed of his train was about 75 miles/h at that time. He told me of the terrible noise of the collision with sparks and debris flying everywhere and of how the coach rolled over onto its right side. He thought he must have fainted for a moment because when he came to all was still and he found himself trapped by the cab door into the right hand corner of the cab. He was very worried in case the Down line was obstructed and after a few moments he managed to force open the small sliding window and wriggle out between the cab side and the ballast. He had no lamp and no detonators, but there were several permanent way men who had been passengers on the Slow train nearby, and while one gave him a lamp another fetched detonators from a nearby platelayers cabin and accompanied him.

17. Driver Rooke told me that he then ran northwards, trying the signal post telephones as he went, but it was not until he got to Signal CA17, beyond the Ouse Viaduct and nearly 1½ miles from the scene of the accident, that he found a telephone in working order and was able to speak to the signalman at Balcombe Tunnel Junction who assured him that the Down line was protected and that there were no trains coming. He then made his way to Balcombe Station, a further 1½ miles, where he was later seen by a doctor before making his way home by taxi.

18. *Guard R. A. Lawal*, stationed at Victoria, was in charge of the Slow train, which he had taken over at Brighton at 21.20 as his last trip of the day. He told me that the driver had not yet arrived and did not do so until about 21.25. He appeared perfectly normal and there was no indication that he might have been drinking. After making the necessary brake test the train left about 2 minutes late. It made the normal stops

at Preston Park and at Hassocks but at Burgess Hill the train overshot the platform somewhat. It then made a normal stop at Wivelsfield and arrived in the Up Local platform at Haywards Heath 3 minutes late at 21.53. Guard Lawal recalled that the Starting signal was at Yellow when they left Haywards Heath at 21.55 and ran forward slowly along the Up Local line. He then felt the train accelerate as it approached Copyhold Junction, as if the driver had received a clear signal, but a few seconds later the collision occurred and the sixth coach, in which he was riding, shook violently and all the lights went out. As soon as the train stopped he jumped down and, after meeting the guard of the other train, set about extinguishing the small fire that had broken out under the rear portion of his own train.

19. The driver of the Slow train was *Driver A. Gilbert*, stationed at Horsham; he was 50 years of age and had been in his present grade for 17 years. He had booked on duty at 17.30 and after standing by had travelled as a passenger on the 18.39 train from Horsham to Redhill where he had again waited until 20.00 when he took over the semi-fast from Victoria to Brighton where it was due to arrive at 20.37. Driver Gilbert's next task was to take the 21.28 Slow train from Brighton to Victoria and he told me that he spent the intervening 50 minutes in making a long telephone call to a lady friend, buying some fish and chips and in going to the lavatory. He said it was about 21.24 when he got back to take over his train and that they left about 2 minutes late.

20. Driver Gilbert was unable to give a convincing explanation of his overrun at Burgess Hill other than to say that he had misjudged his braking. He recalled that the station stop at Haywards Heath was fairly long, about 2 minutes, he thought, and that the Starting signal was at Yellow. He remembered that the fog was patchy after leaving Haywards Heath and that when he saw a Green signal ahead he took it as applying to him and then accelerated towards Copyhold Junction. In retrospect, Driver Gilbert told me he was now aware that he must have taken the Up Through line signal in mistake for his own and he frankly admitted his error. After the collision he had no idea an accident had occurred and he thought that his train had been brought to a stand by a brake application made by the guard.

21. I asked Driver Gilbert about his health and home life and he told me that he had recently been through a divorce case and that he was living on his own and cooking for himself. He had had an operation for a stomach ulcer and had to be careful about what he ate. He found he could not take a heavy meal before going on duty and that this was why he had bought fish and chips at Brighton to eat on the train. He assured me that he had taken no alcohol that evening but that, on account of his domestic and health worries, he found it difficult to concentrate fully on his job. He made the point that, if the line had been equipped with AWS, this accident, the responsibility for which he accepted, might well have been prevented.

22. Travelling on the 21.28 from Brighton as a passenger was *Driver L. D. H. Churcher*, on his way to take over a train that divided at Haywards Heath. He took his seat in the last vehicle of the train and, as departure time approached realised that no driver had yet appeared. He told me that in order to save delay he went to the rear cab, released the handbrake and started the compressors. He said it was a recognised thing for one driver to do this for another but, while he was in the cab, at about 21.28 or 21.30 Driver Gilbert arrived and asked him, in a rather surly manner, what he thought he was doing. Driver Churcher explained to me that Driver Gilbert, whom he had known for a number of years, seemed perfectly normal and that such a reaction was one that was to be expected of him.

23. Also travelling as a passenger on the Slow train was *Leading Trackman W. L. Palmer* who joined the train at Burgess Hill. When the train arrived he thought it was not going to stop and in fact it came to a stand with the third coach half off the end of the platform. He joined the front part of the train and when the lights went out at Copyhold Junction and the train came to a stand he was one of the permanent way men who got down to assist. He met Driver Rooke and so learnt that there was a second train involved and, as he appeared somewhat shaken, accompanied him as far as Signal CA17, from where Driver Rooke spoke to the signalman at Balcombe Tunnel Junction. Mr. Palmer then returned to assist at the scene of the collision.

24. *Mr. G. K. Summerfield* Assistant (Special Duties) in the Divisional Manager's Office made his way to Haywards Heath signal box on learning of the collision. He ascertained that the frame had not been touched since the accident occurred and confirmed that the route was set up for the Fast train with levers 3, 4, 10, 20 and 45 reversed in the frame. The illuminated diagram and all signal and point indicators were out or showing 'wrong'. He then carried out a check on the mechanical interlocking and confirmed that lever 13 could not be moved from the normal position unless lever 16 was reversed and that lever 20 could only be moved from the normal position when lever 16 was normal.

25. Subsequently, a full mechanical and electrical test of the installation was carried out, including the selection circuits for Signals CH13 and CH20, and the cabling between the signal box and signal location, and all was found in proper order.

#### *The Speed of the Trains*

26. Calculated from the distance run by the front unit of the Slow train, approximately 300 yards, after it became divided, its speed at the moment of collision was probably between 50 and 55 miles/h and this agrees with the speed the train would have attained at Copyhold Junction after accelerating normally

from a station stop at Haywards Heath. The speed of the Fast train, as recalled by Driver Rooke in his evidence, was about 75 miles/h but, from its calculated performance on the rising gradient of 1 in 264 its actual speed is not likely to have been in excess of 70 miles/h at the time it passed Signal CH20, and the brake application initiated by Driver Rooke on becoming aware of the Slow train ahead of him on the converging Up Local line would have reduced its speed by perhaps 15 miles/h by the time the first contact between the two trains took place, at a speed differential of probably less than 5 miles/h. On this basis, the tail of the Slow train would have been some 70 yards ahead of the front of the Fast train as the latter passed Signal CH20 and its leading end would have reached the overlap track circuit joint, 386 yards beyond Signal CH13, some 6 seconds later, at which moment Signal CH20 would have reverted to Red. The tail of the Slow train would have cleared the overlap joint, thus allowing the berth track circuit to show clear on the signal box diagram and alerting the signalman to the impending collision, only 4 seconds before it occurred.

#### CONCLUSIONS

27. The cause of this accident was that the 21.28 Slow train from Brighton to Victoria, having started from Haywards Heath on the Up Local line under a Caution signal, passed at Danger the signal protecting the converging junction between the Up Local and Up Through lines at Copyhold Junction. I have no doubt that the signalling was in proper order and that the signal concerned was displaying a red aspect as the train approached and passed it.

28. In looking for a reason for this signal being passed at Danger, I am satisfied that neither the siting of the signal, which was unmistakably positioned with respect to the line to which it applied, nor the prevailing weather conditions of patchy fog which was not thick enough to prevent the clear reading of colour-light signals, nor the pattern of train working which was in accordance with an instruction that had been in force over 5 years, can be held in any way responsible. I can only assume that Driver Gilbert's failure to see the signal or to comprehend its message was the result of his allowing his concentration to wander from his job at the critical time as he approached and passed the signal. The earlier events of the evening, including his late arrival to take over his train at Brighton after having spent much of his layover time in making a long telephone call to a lady friend and his misjudged stop at Burgess Hill, tend to point towards his having allowed his personal affairs to occupy his thoughts to the extent that he just did not react to a well-sited colour-light signal which was displaying a red aspect as he approached and passed it. There was no way in which any other person could have averted or mitigated the effects of the collision which followed, for which Driver Gilbert must bear the sole responsibility. In view of the circumstances, it was indeed fortunate that this accident did not result in serious or fatal casualties.

#### REMARKS

29. The Automatic Warning System (AWS) of train control, by which a driver is warned on his approach to a signal at Caution or Danger by a horn sounding in his cab, which warning must be acknowledged, in default of which the brakes are automatically applied, might well have prevented this accident, and the fact that AWS is not provided on this important line cannot be allowed to pass without comment.

30. The situation with regard to the provision of AWS in the Southern Region was explained, as far as it obtained at that time, by Colonel J. R. H. Robertson in his Report on the collision that occurred on 4th January 1969 between Paddock Wood and Marden on the main line from Charing Cross to Dover which, like the Victoria to Brighton main line, was not provided with AWS.

31. Since that time, the main signalling effort in the Southern Region, within the limitations imposed by restrictions on capital investment, has continued to be directed to the extension of multiple-aspect colour-light signalling, concentrating in the main on the densely trafficked suburban areas for which, for the reasons set out by Colonel Robertson in his Marden Report, there were doubts as to the suitability of the BR standard system of AWS. However, this system is suitable for the less intensively worked areas of the Southern Region and its installation as part of a continuing programme is now proceeding on the Portsmouth line and in the area to be controlled from the new signal box at Feltham. In the case of the Brighton main line, I am informed that the installation of AWS will have to wait the replacement of the existing signalling, which was installed in 1932, since the braking distances then provided for the 3-aspect signalling were calculated to include sighting distances and not measured on a post-to-post basis which is a basic requirement on lines fitted with AWS. I accept that it would not be economic to adapt the existing signalling to permit the installation of AWS at this stage in its life.

32. It was suggested at my Inquiry that this accident would have been averted had Signals CH13 and CH20 been provided with separate berth and overlap track circuits, because the occupation of the overlap track circuit of Signal CH13 by the Slow train would have resulted in Signal CH20 changing from Green to Red when the Fast train was some 300 yards on the approach side of it, at which juncture an emergency brake application by Driver Rooke would have prevented a collision. In the particular circumstances of this accident this is in fact fortuitously true, but in my view an isolated incident of this kind cannot be advanced as an argument for the general readoption of separate berth and overlap track circuits with the additional costs involved.

33. It has also been suggested that the provision of trap points and sand drags could help to prevent this sort of accident. The real object of traps, however, is to prevent slow speed movements obstructing the adjacent line and, had they been provided at Copyhold Junction, the outcome would have been that the Slow train would have hit the solid brick abutment of Copyhold Lane Bridge at 50 miles/h at the very moment the Fast train was passing on the adjacent line at 70 miles/h. The results would have been truly catastrophic.

34. It would not be right for me to conclude this report without remarking on the devotion to duty shown by Driver Rooke, the driver of the Fast train, who, whilst suffering from shock, ran 1½ miles in the dark to reach a telephone. His action was in the highest tradition of the railway service.

I have the honour to be,

Sir,

Your obedient Servant,

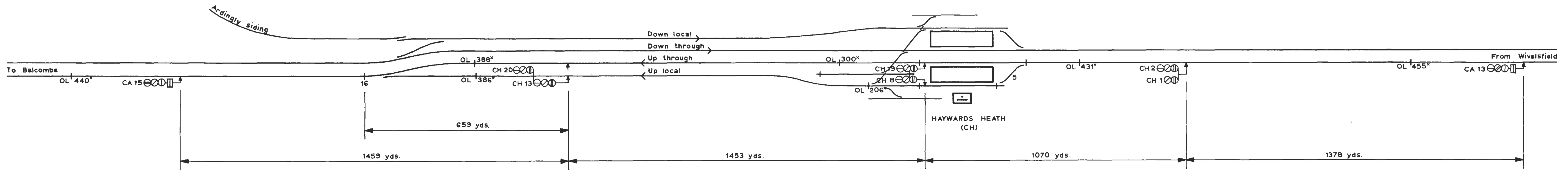
I. K. A. McNAUGHTON,

*Lieutenant Colonel.*

The Permanent Secretary,  
Department of the Environment.

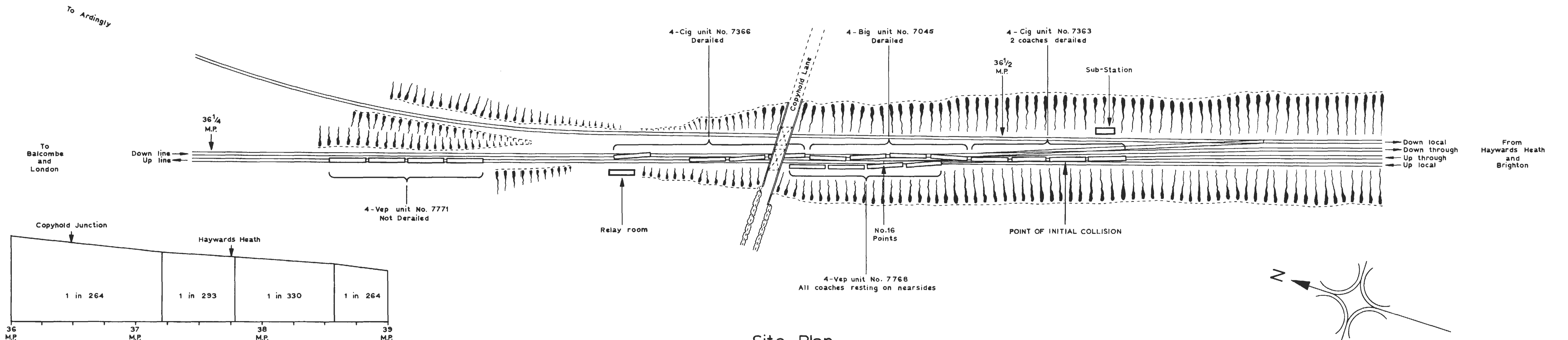


# COLLISION AT COPYHOLD JUNCTION (SOUTHERN REGION) ON 16th DECEMBER 1972.



Signal diagram showing up line signals at Haywards Heath

Not to scale



Site Plan

Scale:- 1:1250

Gradient Diagram

