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DEPARTMENT OF THE ENVIRONMENT

RAILWAY ACCIDENT

Report on the Collision that occurred on 15th December 1971 at Portsmouth & Southsea Station

IN THE
SOUTHERN REGION
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

1972

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22nd June 1972.

SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Order dated 16th December 1971, the result of my Inquiry into the collision between two passenger trains that occurred at 13.15 on 15th December 1971 at Portsmouth & Southsea High Level Station in the Southern Region of British Railways.

The 09.15 locomotive-hauled Cardiff to Portsmouth Harbour passenger train, having passed at Danger the colour-light signal protecting the Down platform line, collided at slow speed with the 11.02 Victoria to Portsmouth Harbour electric multiple-unit train which was standing in the platform, pushing it forward some four feet. The rear bogie of the last car of the Victoria train was derailed causing traction current to be discharged, and the coaches of the Cardiff train became separated from the locomotive. One of the front buffers of the locomotive was torn off but the multiple-unit train was little damaged. 9 passengers received minor injuries and 8 were taken to hospital although only one, who had suffered from a previous back injury, was detained overnight. 7 railway staff were also slightly injured and 5 were taken to hospital but none was detained.

The emergency services were promptly summoned by the station staff and soon arrived. At the time of the accident the weather was damp and dull but the visibility was good.

DESCRIPTION

The Site and Signalling

1. The site is illustrated in figure 1 at the end of this report. The Cardiff train was routed via Fareham and Cosham and through the 20 mph curve onto the Main London to Portsmouth line at Portcreek Junction. The maximum line speed to Fratton is thereafter 85 mph, but a 30 mph restriction applies for 1,080 yards through Fratton Station which is on a right hand curve, and through a left hand curve under Somers Road Bridge some 400 yards past the station. Between Fratton and Portsmouth & Southsea Stations, which are about 1,200 yards apart, there are four tracks in a cutting with brick retaining walls. The Up & Down Main lines lie to the north, and on their Down side there is a Down Relief line and an Up & Down Carriage line known as the 'Back Road'. Portsmouth signalbox lies 350 yards beyond Somers Road bridge on the north side of the lines, and 50 yards beyond it and under a footbridge the lines for Portsmouth Harbour station via Portsmouth & Southsea High Level Station diverge from those entering the Low Level terminus. The Down Main line approaching the High Level station curves first left and then right and rises at a gradient of 1 in 61 reducing to 1 in 400 before the start of the single island platform. A 20 mph permanent speed restriction applies from a point 53 yards before the platform end, so that an unrestricted section of line some 480 yards long remains between the end of the Fratton restriction and this restriction. The High Level station is roofed from 30 yards from the platform end. The line entering the Down platform curves left and the first view of a 4-car train standing in it is from near signal No. WA 448, at a range of about 100 yards.

2. The signalling, which is controlled by track circuit block with 4 & 3-aspect colour-light signals controlled from Portsmouth signalbox was introduced in April and May 1968. Digital train descriptions are initiated by Cosham signalbox when trains occupy a track circuit near Portchester and these are displayed on the signalbox panel at each signal as a train proceeds. The panel is operated by two signalmen, one controlling the lines up to signal No. 74 which protects the diverging connection of the Down Relief line on the approach to Fratton Station and the other signalmen the lines through and to the west of Fratton station. The signalling on the Down Main line from Fratton to Portsmouth & Southsea High Level Station is shown in figure 2. Signal No. 78 is situated at the end of the Fratton Down platform. Signal No. 82 is mounted on a gantry beside signal No. 80 which applies to the Down Relief line, and can be first seen prior to passing under Fratton Road bridge some 250 yards from the signal. Signal No. 86 is similarly paired on a gantry with Signal No. 84 and can be seen when passing under Somers Road bridge 240 yards before the signal. Mounted above signal No. 86 is a route indicator which reads 'M' when the signal is cleared for the High Level station. The signal protecting the station, an automatic No. WA 448, is mounted on the left of the line 16 yards before the platform end, and 47 yards before the station canopy where the overlap track-circuit joint between track circuits 'MX' and 'NA' is situated. The lines are electrified on the 750 volt DC 3rd rail system.

The Trains

3. The electric multiple-unit (EMU) train consisted of a 4-car unit of 1963 mainline stock classified 4-CIG. The unit, No. 7303, consisted of two Driving Trailer Composite cars, with a Non-Driving Motor Open Second Brake and a Trailer Open Second between them. Buck-eye couplers were fitted throughout and the outer ends of the unit had side buffers. It was 265 feet long overall and weighed 150 tons. The

Cardiff train consisted of 5 corridor coaches and one corridor brake van of MK 1 stock hauled by a diesel hydraulic locomotive of Class 35. It was 442 feet overall and weighed 280 tons of which 75 tons was the weight of the locomotive. Vacuum brakes were fitted throughout. On the gradients approaching the high level station such a train can stop in 65 yards from 20 mph, which allows 2.5 seconds for the propagation of the vacuum brake.

The Damage Resulting from the Accident

4. The damage to the electric multiple-unit was slight and consisted mainly of light damage to the rear car where it was in collision with the locomotive. The buffers were bent, the auto-coupler damaged, and a shoe beam broken. Interior damage occurred throughout the unit; sliding doors came off their runners and the gangways suffered some damage. The locomotive suffered a badly bent buffer and other cab-end damage as well as minor underframe distortion. The impact, which must have occurred before the brakes of the passenger coaches were fully applied, caused the leading coach to become separated from the locomotive by some 4 feet. Its buffers were bent, its gangway damaged and its vacuum and other pipes were torn off. Throughout the train toilet basins were loosened, mirrors broken, and three axle boxes on the rear coach were broken.

EVIDENCE

5. On duty at the Portsmouth Town and Harbour end of the panel in Portsmouth Signalbox was *Signalman A. D. Richardson*. He took up duty at 06.00 and found the signalling apparatus working efficiently although there had been difficulties caused by signals being replaced to Danger because of equipment failures. Because there was a Down Waterloo to Portsmouth Low Level train standing in Fratton Station on the Down Main line, he routed the 11.02 Victoria train which was running about 2 minutes late, from signal No. 74 onto the Down Relief line to stop at Fratton, and thence via points No. 268 into the High Level station on the Down Main line. He was sure that the Waterloo train left Fratton ahead of the Victoria train. He saw the 09.15 Cardiff train described on the panel approaching Fratton and believed that he set the route from signal No. 74 to No. 86 on the Down Main line, but he was sure that he did not set the route up to signal No. 78 only, as was sometimes done when certain shunting movements were to be made. He has told me that he was sure that signal No. 78 had not been replaced to Danger because of any technical fault and he was certain that had it been replaced to Danger when he was setting up the route he would have noticed it. After the Victoria train was in the high level station platform, he set the route for the Cardiff train from signal No. 86 to automatic signal No. WA 448 to allow that train up to the latter signal as soon as the Victoria train was clear of the overlap beyond No. WA 448.

6. He told me that the usual speed at which trains passed his signalbox was about 20 mph, but when the Cardiff train passed he thought it was going faster than usual and that it was under power. He saw the description of the Cardiff train on the signalbox panel indicator on the approach side of signal No. WA 448 but it disappeared, although that of the Victoria train remained displayed in the panel's indicator as in the platform, and track circuit NA was certainly shown on the panel as being occupied.

7. The driver of the Victoria train was *Driver A. Hughes*. He confirmed that he was routed down the Relief line from Fratton, and he told me that he never saw the Waterloo train on the Down Main line ahead of him. All the signals in the Down Relief line were green for him and he brought his train into the Down High Level platform and stopped at the 4/6-car stop board with sufficient brake applied to hold the train. After one or two minutes he felt a severe bump from the rear. He got out and went back to see what had happened and met the driver of the Cardiff train who said to him "I had a green at the bottom of the bank". Hughes told me that he had driven into Portsmouth for 7 years, and ever since the new signalling had been introduced had never been held at signal No. WA 448 outside the station, although he said he would have no difficulty in restarting from that signal on the rising gradient. He said he never confused signals Nos. 84 and 86 even when travelling on the Down Relief line (No. 86 comes into view before No. 84), and the route indicators above these signals in no way affected his view of the yellow or green signal aspects.

8. *Guard H. S. G. Matthews* signed on duty at Bognor at 07.15 and took over the 11.02 Portsmouth train at Victoria. They had an uneventful journey but left Barnham 5 minutes late and were further delayed at Warblington by signals. About 1½ minutes after their arrival at Portsmouth High Level Station his station duties were nearly completed and most of the doors of the train were shut when he saw a lady passenger at the front of the train undecided as to whether she should alight or not. The indicator for signal No. WA 450 was showing 'Off' and he was about to give the driver the signal to start when the Cardiff train collided with the rear of his. He received a cut over his left eye which bled profusely. He thought he had 15 to 20 passengers on his train on arrival at Portsmouth. He had only worked on the route since June 1971 but on no occasion had his train ever been held at signal No. WA 448.

9. *Assistant Station Manager R. C. C. Brown* had served at Portsmouth since 1964, and on the day of the accident as part of his daily supervisory duties he visited the signalbox at 12.50. He left at about 13.10 and on going down the internal stairs heard the 11.02 Victoria train pass by. In making his way back to the station he crossed a paved area beside the signalbox and when he was about 15 yards from the signalbox he saw the 09.15 Cardiff train pass by. He told me that the locomotive seemed to be under power and travelling faster than usual. He had only walked a few yards further when he heard a loud bang, and on

calling up to the signalman was told that the Cardiff train had run into the Victoria train. He heard no whistle sound. He went round the back of 4 wagons standing in a siding and then saw signal No. WA 448 showing a red aspect with the rear of the Cardiff train beside it. On arrival at the High Level Station he found that the front coach of the Cardiff train was separated from the locomotive by some 4 yards. He then telephoned the Station Supervisor and was told that the emergency services had already been called.

10. *Fitter G. M. Downes* was standing by a luggage lift opposite the rear of the Victoria train on the Down platform when a lady passenger asked him when the following train would be in. On looking towards the signalbox he saw the Cardiff train approaching at the bottom of the incline. He turned to talk to the passenger and when he looked back he saw the locomotive passing signal No. WA 448 at about 15 mph. He knew it was coasting because it was making a particular whine. He raised both hands as a warning signal and as the locomotive entered the covered part of the station (some 45 yards past the signal) he saw the driver rise from his seat and apply the brakes. The locomotive was then only some 40 yards from the rear of the Victoria train which it hit without slowing down very much. After telephoning the engineer's office at Fratton he opened the isolating switch in the guard's compartment of the Victoria train and then closed the fuel supply cock on the outside of the Hymek locomotive.

11. *Signal and Telecommunication Technician V. James* was on duty in Portsmouth signalbox at the time of the accident. Immediately after it he confirmed that track circuits MX and NA were showing occupied on the panel and that signal No. 86 was indicated as showing a red aspect. He told me that prior to the accident no work had been done to any of the signalling circuits involved.

12. *Signal and Telecommunication Supervisor B. D. Swift* arrived at Portsmouth at 15.30 and between 16.24 and 20.15 fully tested the routes from signals No. 86 and WA 448. All cables were tested to earth and all track circuit and signal relays were tested and found to be in perfect condition. He told me that the cables to signal No. 86 pass from the signalbox in line-side troughing and then over the gantry on which the signals are mounted, and nowhere are they in the ballast under the track.

13. The guard of the 09.15 train from Cardiff was *Guard R. P. Diaper*. He had relieved a Cardiff guard at Bristol and received a train preparation form from him stating the total weight of the train as being 205 tons. After carrying out a brake test they left on time, and after changing drivers at Westbury they also left there at the right time at 11.15. They changed drivers again at Salisbury and again left at the right time at 11.57. They had a 20 mph speed restriction approaching Dean but arrived at and departed from Southampton at the right time. They were 2 minutes early at Fareham but left at the right time, and he did not check the times thereafter. He was aware of slowing down on the approach to Portcreek Junction, and again approaching Fratton, but otherwise they appeared to be travelling at a normal speed. He thought they were travelling at about 20 mph and certainly not 30 mph on passing Portsmouth signalbox when he stood up to go to the window and there was a loud bang and he fell. He was hurt but walked through the train to the platform where he gave his detonators to a member of the platform staff and asked him to go back to protect the line; he was then taken to hospital.

14. *Secondman T. J. Neagle* shut off the train heating boiler in Fareham and was in the leading cab of the locomotive thereafter, he told me that he remembered slowing for the junction at Portcreek and passing through Hilsea Halt. They had a double-yellow aspect before passing through Fratton but he was sure that the signal had changed to green before they passed it and the following signals were also green. He next remembered passing Portsmouth signalbox and he saw three men he assumed to be signalmen looking out of the window. He did not remember seeing the aspect of the signal approaching the signalbox (No. 86). As they passed under the footbridge beyond the signalbox and turned left and then right onto the incline approaching the High Level station he saw signal No. WA 448 displaying a red aspect. The driver had shut off power by then and the train was coasting at a steady speed as if to stop in the station. When they were quite close to the signal he said to the driver in a fairly loud voice "Is that our signal" by which time the driver was beginning to brake the train. He told me that he didn't call out before because he was expecting the driver to stop the train at the signal, but instead they passed it at about 15 mph. On seeing the train ahead they both stood up and together made for the internal door at the rear of the cab, and the collision occurred almost immediately. Secondman Neagle who had been a Western Region driver, was not passed for the route to Portsmouth, although he had previously made the trip about 4 times since the colour-light signalling had been introduced. On none of those occasions had he seen signal No. WA 448 at Danger.

15. *Driver H. J. Bell* signed on duty at 11.36 at Salisbury and took over the 09.15 Cardiff to Portsmouth train there. The previous driver told him that the EAB valve disc had been punctured and he explained to me that with it punctured his brake would not only apply but also release more quickly. The journey to Fareham was uneventful although he had signal checks at St. Denys, Woolston and Netley, and his brakes were working efficiently. He slowed to 20 mph, for the curve at Portcreek Junction and thereafter he drove at about 65 mph on green signals until he received a double-yellow aspect at Signal No. WA 446. The next signal, No. 72, was showing a single-yellow aspect as was the following one No. 74 where the Down Relief line diverges. He was expecting to be stopped in Fratton Station at signal No. 78 but it was showing a green aspect as it came into view. He said that he passed through Fratton Station at about 30 mph and saw no train on the Down Relief line.

16. I questioned him several times on the aspects of signals Nos. 72 and 74 but he was adamant that they both showed single yellow aspects. As he approached signal No. 82 he saw it change from a single-yellow to a green aspect and he was certain that signal No. 86 approaching Portsmouth signalbox was also showing a green aspect, and the route indicator above it a letter 'M', which indicated to him that he was routed correctly into the High Level Station and was clear to enter the platform. He noticed also that signal No. 84 on the Down Relief line on the same gantry as No. 86 was showing a red aspect.

17. Driver Bell told me that he generally looked at signalboxes as he passed them and he did so at Portsmouth. He saw the signalmen very clearly and was sure that one of them was standing between the panel and the signalbox window (the signalmen denied this). He shut off power and drove his train at about 20 mph so that it would come to a stand in the platform. He did not hear his secondman mention signal No. WA 448, and as they entered the covered portion of the station he suddenly saw the illuminated red blind of the multiple-unit train ahead and immediately made an emergency brake application, but there was not then time for it to stop the train before the collision occurred. He did not see Fitter Downes making his warning signal. He admitted that he had not looked at signal No. WA 448.

18. Driver Bell told me that although his windscreen was not perfectly clean it was clean enough and he had a clear view. The locomotive was not fitted with windscreen washers but his wiper was in working order. He said that although he had driven regularly into Portsmouth since the colour-light signalling had been introduced he had never before been held at signal No. WA 448, but he agreed that he would have no difficulty in starting his train from it on the steeply rising gradient.

19. Driver Bell had been a driver for 10 years, and had signed for the Portsmouth route five times since the new colour-light signalling had been introduced in 1968. On Thursday, 9th December, he had signed on duty at 05.55 and had taken a train into Portsmouth signing off duty at 15.00. He took a day off duty on 10th December because his father had died, and had a rest day on the 11th. He worked a relief duty on Sunday 12th from 18.30 to 01.40 the following morning and had a rest day on the 13th. He had worked from 11.36 to 17.14 on the day prior to the accident which were the same hours he was working on the day itself. I asked him if he thought that the death of his father had upset him in any way, but he said that because he had not been very close to him he thought that it had not, but he had been concerned about his mother.

20. *Mr. J. H. Bartlett, Traction and Train Crew Superintendent* at Bristol, told me that Class 35 (Hymek) locomotives are driven in 'Power Notch 1' when idling or coasting and their diesel engines then make a deep noise which often leads people into believing that they are under power when they are not.

SUBSEQUENT INVESTIGATIONS

21. On the day prior to my Inquiry it was reported to me that the type CE 391 50 cycle AC relay of track circuit NC situated on the Down Main line, two track circuits ahead of that in the platform in which the collision occurred had jammed and failed to function for safety. Had track circuit NA similarly failed then signal No. WA 448 would not have displayed a red aspect and signal No. 86 could have displayed a green aspect. The failure was a mechanical one and all similar relays in the Portsmouth control area were immediately checked and no other dangerous conditions found. The British Railways Board and the other Regions of British Railways were informed immediately so that similar relays could be checked everywhere. Such relay failures occur extremely rarely and I am quite satisfied that this failure was in no way connected with the present accident. In view of the failure however, I asked for the signalling and all the relays controlling signals involved in the accident to be re-checked; this was done at once and everything was found to be in excellent condition.

22. I have studied extracts from the signalbox registers at Cosham and at Portsmouth, and I am satisfied that there is no evidence that Bell was driving at above the permitted speed: although he left Fareham on time, was 1 minute early in passing Cosham signalbox (a distance of $5\frac{3}{4}$ miles), and was $4\frac{1}{2}$ minutes early on arriving at Portsmouth (a further $4\frac{3}{4}$ miles), but the timings allowed for this train are generous. These times indicate this his run was a fast one but not unduly so.

23. Bell's eyesight was tested after the accident by a Southern Region Medical Officer *Dr. M. A. H. Webb*. He has told me that Bell's vision acuity is excellent and that his colour vision very good. He used the Edridge Green lantern test and also the Ishihara diagram tests, and Bell completed them without any hesitation or difficulty whatever.

DISCUSSION

24. I believe that signals Nos. 72 and 74 were showing green aspects when Driver Bell passed them in spite of his having told me that they were showing single-yellow aspects. The signalman can set the route from No. 74 signal to No. 78, No. 82, or to No. 86, and automatically thereafter to No. WA 448 signal. The first of these routes is only used when the crossover ahead of No. 78 signal is to be used which was not the case on this occasion. The route is set to No. 82 when the signalman needs to keep the route between the Back Road and the Low Level station open, but with no move to be made the signalman would set the route to No. 86 and to No. WA 448 signal, and this is what Signalman Richardson said he did.

25. Whether the route was set to No. 82 or to No. 86, signal No. 74 would have shown a green aspect. The signalman then set the route to No. WA 448. Driver Bell told me he saw signal No. 82 change from a yellow to a green aspect; either the Victoria train was already clear of No. WA 448 signal's overlap or the aspect changed automatically as the Victoria train cleared No. WA 448's overlap.

26. The aspect of signal No. 72 as Bell passed it depended on the time that the signalman set the route from signal No. 74. Secondman Neagle said that he saw the preceding signal (No. WA 446) clear from a double yellow to a green aspect as they approached it and this could only have been when the signalman set the route from signal No. 74; in which case No. 72 should have also been showing a green aspect. The only reason for signal No. 74 to be showing a yellow aspect would have been a temporary 'safe-side' fault which held signal No. 78 at Danger—but no such indication was noticed by the signalman and no such failure is noted in the signalbox records for November or December 1971 and January or February 1972, and I do not believe that one occurred.

CONCLUSIONS

27. The collision occurred because Driver Bell failed to observe colour-light signal No. WA 448 which he passed at Danger into collision with the Victoria train standing in the platform. Either he misread colour-light signal No. 86 as showing a green aspect when it must have been showing a yellow aspect, or he wrongly assumed from the yellow aspect under the route indicator showing a letter M, that it was clear for him to enter the platform. It seems likely that he also misread two previous signals taking them for yellow when they probably showed green aspects.

28. Although a most serious, although extremely rare, 'danger-side' relay failure occurred in the vicinity after the accident I am satisfied that it had no connection with the cause of this accident, and that the signalling was functioning correctly.

29. Because his visual acuity and colour perception were excellent and there is no evidence that he misread the signal for any physiological reason, I believe that Driver Bell was making assumptions about the state of the line ahead without looking carefully at his signals. He probably assumed from the letter 'M' indicated in the route indicator over signal No. 86 and the fact that he had never previously been held at signal No. WA 448, that the route was clear for him to enter the platform. He was looking carefully into the signalbox window to his right when he should have been looking to his left up the incline to see the Danger signal ahead. The loss of his father five days before the accident may have indirectly and sub-consciously contributed to his lack of concentration.

30. Standard BR AWS gives the same warning at all restricting aspects, requiring the same cancellation by drivers. Because line speeds are low and the traffic dense, the signalling on the approaches to Portsmouth is closely spaced. With such signalling BR AWS has not always prevented drivers passing signals at Danger. In this case however, because Driver Bell had been driving on green aspects from Fratton, I believe that AWS would have prevented this accident.

I have the honour to be,

Sir,

Your obedient Servant,

A. G. TOWNSEND-ROSE,

Lieutenant Colonel

The Permanent Secretary,
Department of the Environment.

COLLISION AT PORTSMOUTH HIGH-LEVEL STATION

15th. DECEMBER 1971

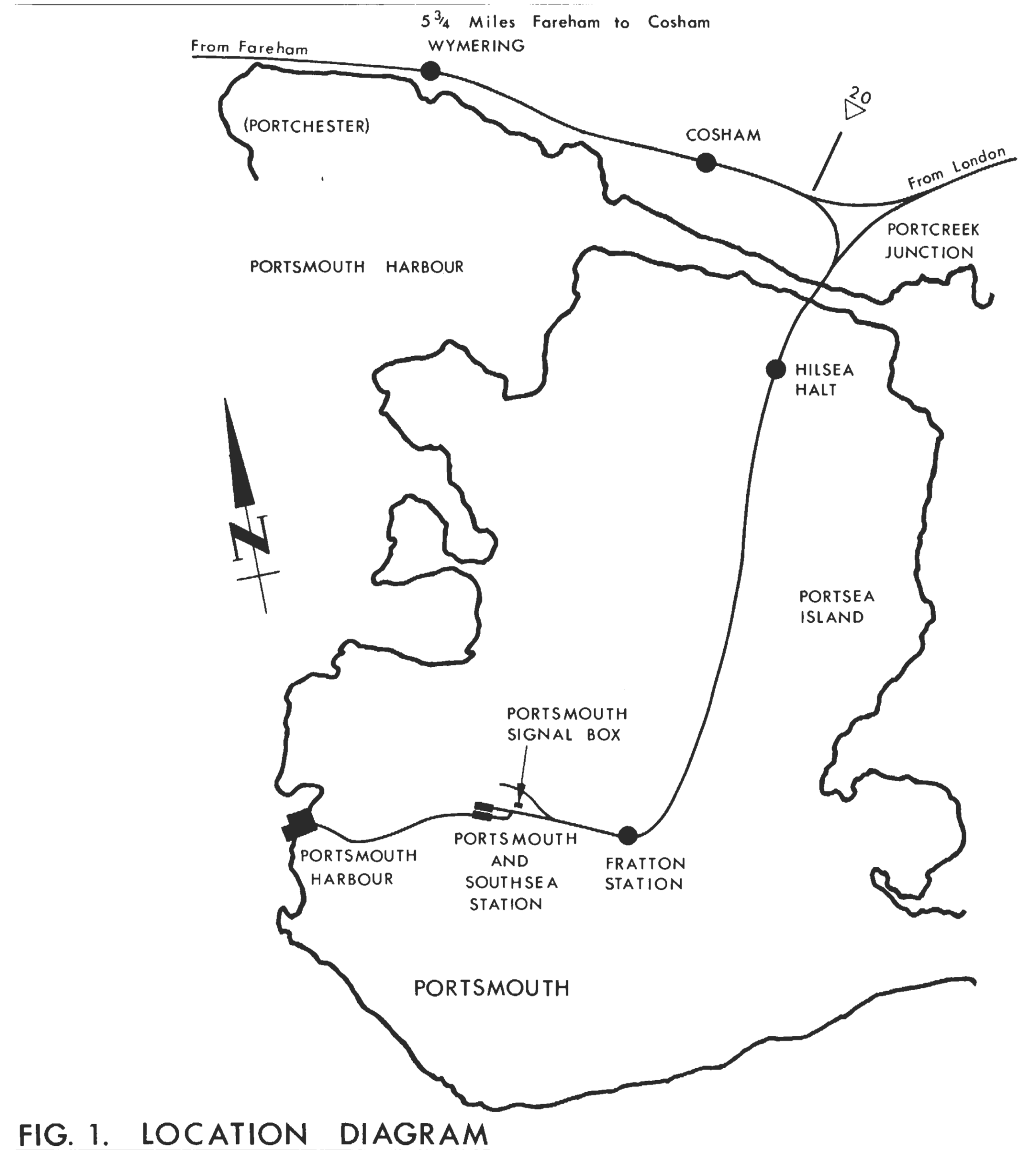


FIG. 1. LOCATION DIAGRAM

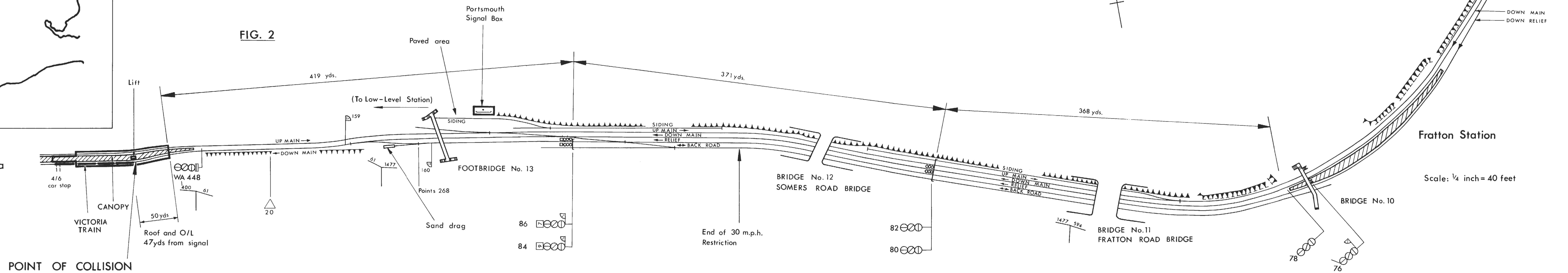


FIG. 2

Fratton Station

Scale: 1/4 inch = 40 feet