



BLUEBELL RAILWAY EDUCATION DEPARTMENT

3a. Signalling System

1. Railways need a signalling system to control the passage of trains so as to prevent accidents occurring. In the early days of railways a timing system was used, trains leaving a station at least ten minutes after the previous train had left and lineside “policemen” could stop a train if it arrived at their position before the ten minutes had elapsed. Problems occurred however when trains broke down after leaving a station or passing a “policeman” and accidents happened. A system of semaphore signals was therefore developed, each signal displaying a simple message, stop or go.
2. Each station had a signal box which controlled all movements into and out of the station area, before a train can leave one station it has to be accepted by the Signaller at the next station.



3. The Sheffield Park Station Signal Box on platform 1, shown below, has a 19 lever signal frame, with black, blue and red levers.



4. Each of the levers does a different job:-

- The black levers move the points which set the route for the train.
- The blue levers lock the points so that they can't move under a train and so derail it.
- The red levers operate the signals, which act as traffic lights, telling the driver when it is safe to move. (Nos. 16, 18 and 19 are slightly shorter than the rest because they are powered electrically and so require less effort to move).

5. The signals and points are generally worked by wires and rods between the signal box and the signal post or the points and considerable effort is often needed to move the levers - standing on platform 2 opposite the signal box, the wires and rods can be seen below platform 1.

6. Above the signal frame sit a row of brass instruments with pointers which move from side to side. These are called repeaters and they indicate to the Signaller the position of each signal that is, whether they are at danger or allow the train to move: they are there because the Signaller cannot see all of the signals along the line controlled by the box. The Signaller can thus ensure that the signal is showing the correct aspect - stop or go - before the train moves off.

7. The map above the shelf shows all of the tracks controlled by the box and as a train moves along the line red lights go on and off to indicate to the Signaller where the train is.

8. The signals themselves are located at the top of signal posts and there are a number of different types. On those at Sheffield Park (on the left below) the signal arm falls from the horizontal to tell the driver that he can move the train, whereas at Horsted Keynes (on the right below) the signal arm rises. In either case, when the signal arm is horizontal it means danger and the driver cannot pass it without the Signaller's permission.



9. Further information about our signalling system can be obtained from our historical website – www.bluebell-railway.co.uk



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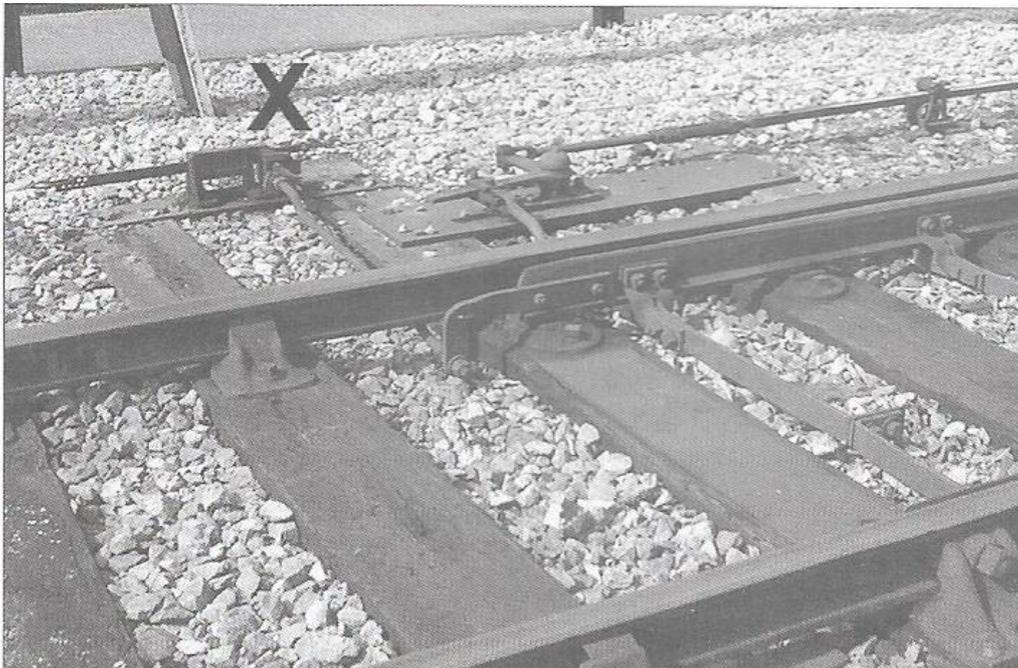
3b. Points

1. Unlike cars, which can follow any suitable road between two places, trains have to follow a set route to their destination and this route is determined by where the rails have been laid. There is however scope for trains to move between different tracks on lines with more than a single track and between the main line and various sidings. Nor can trains stop quickly and in order to prevent accidents the route that they are to follow has to be set before they can leave the station. This is done by the Signaller in the signal box.
2. Signal boxes on the railway control not only control the signals – which tell the driver when it is safe to go - but also the associated points - and the two have to be interlocked so that it isn't possible for a signal to indicate that a train must go in a certain direction while the points are set for another. If that were to happen accidents could arise.
3. On the Bluebell Railway the signals and points are generally controlled by a system of levers in the signal box, connected to the rails by pre-tensioned wires and rods. Some points are however electrically operated, usually where they are a long way from the signal box and the distance involved would make a mechanical system difficult to operate.
4. The photograph below shows the signal box at Sheffield Park Station. This has a 19 lever signal frame, with black, blue and red levers. – The black levers move the points while the blue levers lock the points so that they can't move when a train is passing over them. (The red levers operate the signals themselves).



5. The levers in the signal box are connected to which pass along the track and connect to rods alongside the track which actually operate the points. These rods can be seen in the photograph below.

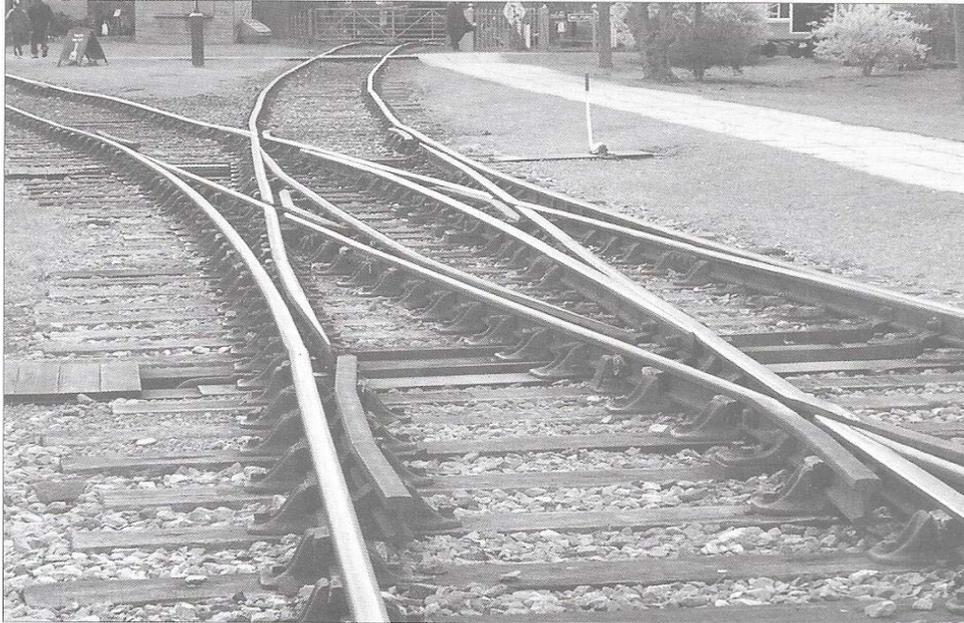
6. Also shown in the photograph is the system of interlocking. The wire which operates the adjacent signal passes through the interlock frame (marked X), which will block its movement unless the points are set correctly so as to agree with the signal.



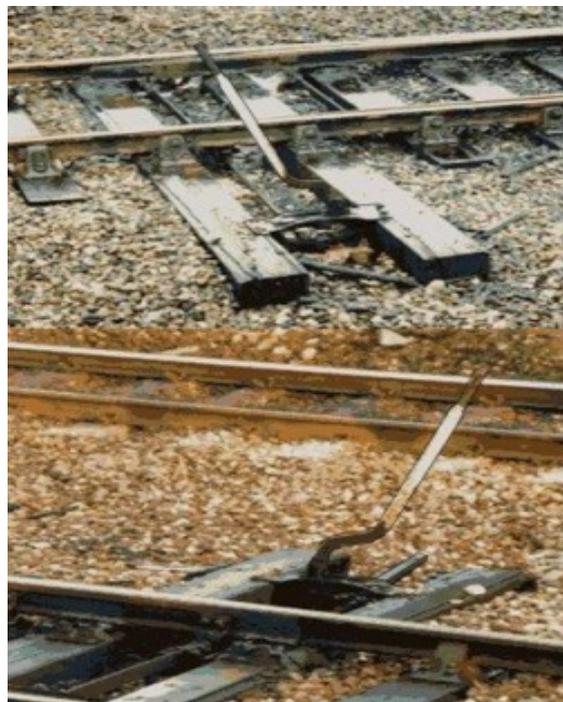
7. The photograph below shows a system of very basic points in a siding. A train approaching the camera could either go straight ahead (on the right hand track) or switch to the left hand track. In this case the route has been set for the train to take the right hand track. Because these points are installed on slow speed lines in a siding they are controlled not from the signal box but by means of the levers that can be seen in the centre and to the right of the photograph.



8. A more complicated set of points can be seen in the in the photograph below, which shows a double slip point where any track can be set to any other track. In this case the route set is for a train going away from the camera and taking the track to the left. Again, such points are used primarily in sidings and other slow speed areas where they save space, such points would not be seen on high speed main lines. One of the levers used to change the points can be seen on the right.



9. The following photograph provides a close up view of the points levers used in sidings.



10. Further information about the rails and the points system can be found on our historical website – www.bluebell-railway.co.uk