

New Rugby kit

For most of last summer, the normally four-track railway south of Rugby – two main lines and two coming in from Northampton – were reduced to just two while Network Rail demolished and rebuilt the flyover which carries the down Northampton line over the up main line. The new flyover was brought into use as planned in early September 2007 and allows the alignment of the up main to be improved so that trains will be able to run at the maximum line speed of 125mph.

During these major engineering works – which were carried out in the centre of the layout while trains continued to pass on either side – all northbound trains from the Northampton lines, including freight trains from Daventry International Rail Freight Terminal (DIRFT), had to cross the path of all southbound main line trains. To do this, they used the new Hillmorton Junctions, a series of single leads allowing access across the entire four-track layout in both directions installed to the south of Rugby and opened earlier this year. Similarly, all southbound main line trains initially took the Northampton line and then used these junctions to regain the main line. Meanwhile, the new down platform line on the west side of the station has been brought into use, with direct access from the Northampton line via the flyover without conflicting with the down main.

Both the new Hillmorton Junctions and this new down platform line at Rugby are for the moment controlled from the existing 1964-built Rugby Power Signal Box (PSB), which still has its original, albeit somewhat modified, entrance-exit (NX) panel. During the Christmas 2007 commissioning, control of the down lines through Rugby – the new platform line, the new through line and the existing down platform line, together with the down junction for the Birmingham line – will be switched to an interim ‘free-wired interlocking’ ahead of a mid 2008 migration to the new Rugby Signalling Control Centre (SCC) situated on the up side of the line alongside the up yard. The up lines will for the moment continue to be controlled by the PSB.

Rugby SCC, the first part of which was commissioned in May 2004, already controls significant parts of the West Coast main line. It controls the stretch from just north of Kings Langley to Linslade, including the new Ledburn crossovers. From Castlethorpe, north of Wolverton, to north of Kilsby Tunnel, just short of the new Hillmorton junctions on the main line, and to just south of Northampton on the loop line, was resignalled by Atkins with SSI controlled from the new SCC. The Northampton station area itself is due to switch from Rugby PSB to the new SCC in early summer 2008.

Milton Keynes

Between Linslade and Castlethorpe, Bletchley PSB still controls both the complex there and the junctions at Milton Keynes, where work is already under way to create additional loops, one alongside the present down fast, and the other by extending the present London-facing bay alongside the up slow lines. This work is scheduled for completion by December 2008 and the remainder of the Bletchley control area will then switch to Rugby SCC in 2009, when the PSB will close.

Meanwhile to the south, options are being examined for the replacement of Watford PSB, another box with an NX panel dating from the original West Coast electrification scheme in 1964. The Watford area is likely to be controlled from Wembley in the future.

And to the north, with the Coventry resignalling on the line to Birmingham now complete (September issue), and sections of the newly quadrupled Trent Valley line ready for use, the stage is set for several further extensions of the Rugby SCC in the next few months. It is currently envisaged that parts of the new track layout at Nuneaton will be commissioned at Easter 2008, with the remainder in August when the 1963-built PSB there will finally close.

Six new Solid State Interlockings (SSIs) have been supplied by Invensys (Westinghouse) for the Trent Valley widening. These will be

A down Virgin Pendolino swings across from the down main line into the original down platform at Rugby. To the right of the train, work is progressing on the new crossover which will take trains from the new down fast line to the additional new down platform line, while the soon to be replaced Rugby power signal box, dating from 1964, is in the background. Alan Williams

commissioned in stages from Christmas 2007 to August 2008, all under the control of Rugby SCC; this will involve including replacement of the boxes at Tamworth and Lichfield.

The Hillmorton Junctions and the final parts of the Rugby station layout – paradoxically those only yards from the new SCC – will not come under its control until November 2008, when the rebuilding of the up island platform is complete and the PSB is finally closed.

Six workstations

When fully operational, Rugby SCC will supervise over 100 route miles of mainly quadruple track main line from six VDU workstations supplied by GE. From the south, these will control the complexes at Watford, Bletchley, Northampton, Rugby, Nuneaton and then along the Trent Valley. In addition, large overview panels all along one wall show the state of the entire controlled area. Currently, these take the form of back-projected screens, but consideration is being given to replacing them with higher definition LCD (liquid crystal display) screens. There are also three LCD displays which show the train movements from Euston to Watford, giving signallers prior information of train movements beyond the area of control.

GE, in collaboration with TRE and with support from Network Rail, is developing a system known as Signaller’s Assistant for installation at Rugby SCC. As well as routing trains to minimise overall delay during normal operation, Signaller’s Assistant will provide special facilities to help signallers during times of serious disruption (perturbation). It will be able to route trains in the rest of the area whilst the signaller concentrates on a particular problem or failure, it will have a special ‘congestion busting’ mode to clear trains from an area as quickly as possible and it will be possible for staff at Rugby SCC to make short-term changes to the system to accommodate temporary speed restrictions and other signalling changes.

In addition to the main operating floor, the new SCC incorporates a training room for both new signallers and those coming from other locations. It, too, is equipped with several workstations, and instructors can both replicate routine operations and introduce specific scenarios such as working during failure of equipment, single line working or emergencies.

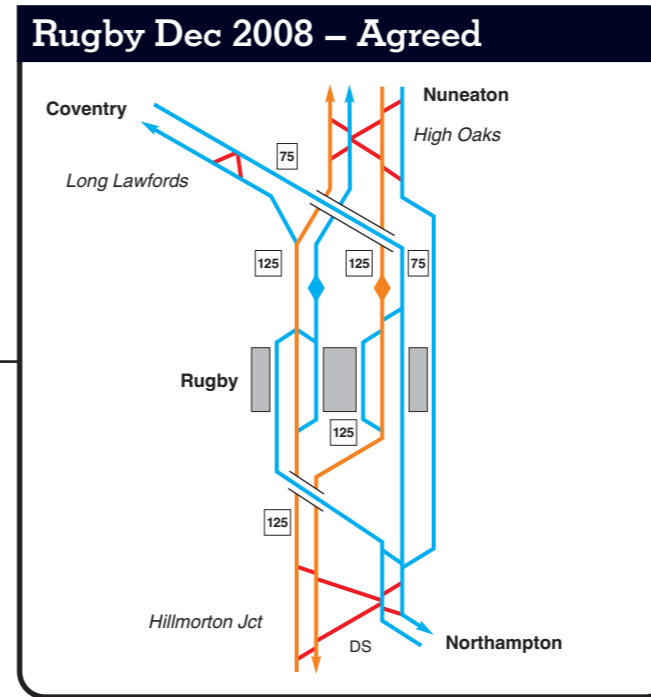
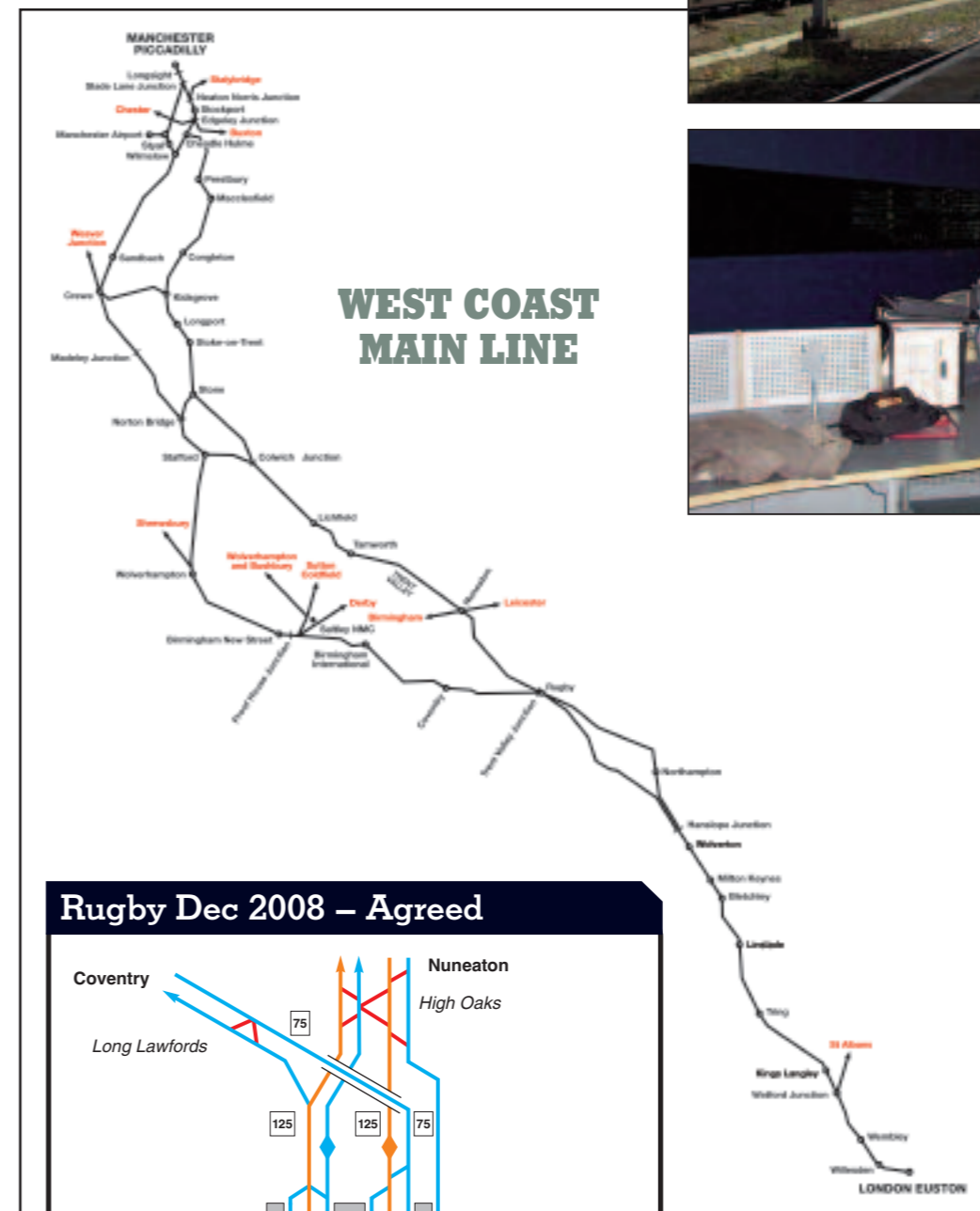
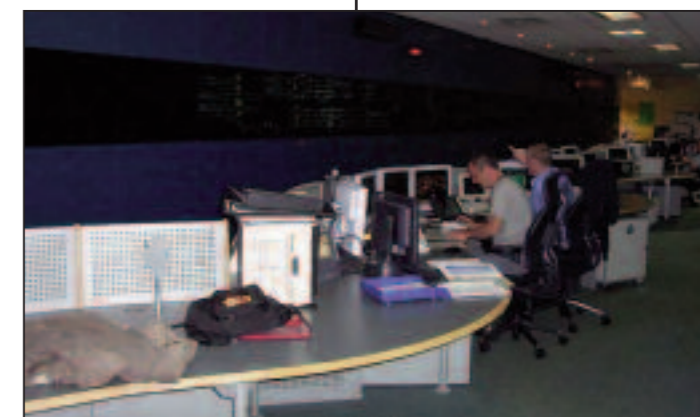
Facilities will also be provided at Rugby SCC to evaluate the route setting performance of the Signaller’s Assistant under a wide range of scenarios, so that the system can be fine-tuned and perturbation plans for possessions, other planned disruptions and train or infrastructure failures can be developed ahead of time. Modelling the performance with outputs in delay minutes will give the operations team the facility to select the best solutions when such incidents occur. Signaller’s Assistant is the next generation of Automatic Route Setting for NR’s major control centres and it is the intention to roll out the technology to the new control centres being built as part of the Sector A projects.

Virtually the entire Rugby SCC control area is equipped with conventional four-aspect colour light signals, similar to those they replace, although many have Dorman LED (light emitting diode) heads, and in some cases the spacing has been changed to allow increases in line speed at 18 separate locations. The Rugby installation will also see more use of Preliminary Route Indicators (PRIs) used in conjunction with flashing yellow aspects to give drivers advance warning of which route is set where more than one high speed divergence is possible.



Right: During the closure last summer of two of the four tracks south of Rugby while the flyover was being built, unchecked passage through Rugby was not always possible. Here, a southbound Virgin Pendolino takes the Northampton line out of the up platform at Rugby before regaining the main line further south at the new Hillmorton Junctions, while alongside a sister Pendolino waits to follow. Alan Williams

Below right: Low level lighting enables signallers to concentrate on the six workstations in Rugby SCC, each of which controls a major geographical group of interlockings. The panel along the rear wall gives a continuous overview of the entire 100mile-plus part of the West Coast main line which will eventually be controlled from Rugby. Alan Williams



Also to be trialled are so-called ‘green banners’. Used where sighting of stop signals is reduced, current banner signals give drivers advance notice of whether a concealed signal is at danger (a horizontal black bar) or cleared (a black bar inclined at 45degrees). But they give no indication whether a ‘caution’ aspect (yellow or double yellow) or ‘proceed’ (green) is being displayed. Now trials are under way whereby the normally white background of the banner becomes green if the signal it repeats is also showing green, and early indications are that drivers are enthusiastic.

Stafford

To the north of the Rugby SCC control area, the signalling at Stafford, which takes the form of four aspect colour lights worked from two 1950s-era, LMR-design mechanical lever signalboxes, has been refurbished in recent years

and is not due for renewal until 2014. The four-tracking of much of the Trent Valley line, and the increased number of trains it will allow, will further emphasise Stafford as one of the last pinchpoints on the line between Euston and Crewe, as up trains routed to Wolverhampton and Birmingham vie for paths with down main line trains. Flyovers have been mooted, but the sharp curve on the main line south of the station would still remain as a barrier to higher speeds, and current thinking is that a high speed bypass line would be the best option, with plans being worked up for approval next year. Alan Williams

Alan Williams has written several books on signalling and is an Associate of the Institution of Railway Signal Engineers