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MINUTES OF MEETING HELD FRIDAY 20 MAY 2022, AT THE SURREY HILLS NEIGHBOURHOOD CENTRE, 1 BEDFORD AVENUE, SURREY HILLS, VICTORIA.

The SRSV meeting scheduled for Friday 20 May 2022 was held on site at Surrey Hills and was broadcast as an online meeting on the internet using the 'ZOOM' application.

Present: – (On site) Glenn Cumming, Graeme Dunn, Michael Foley, Chris Gordon, Judy Gordon, Andrew Gostling, David Jones, Keith Lambert, David Langberg, Andrew McLean, Roo Richards, Laurie Savage, James Sinclair and Rob Weiss. (14)

(Online) Ken Ashman, Noel Bamford, Robert Bremner, Brett Cleak, John Dennis, Michael Formaini, Peter Gerandt, Graeme Henderson, Bill Johnston, Neil Lewis, Eddie Oliver, Peter Silva, Rod Smith, David Stosser, Bob Taaffe, Andrew Waugh and Andrew Wheatland. (17)

Apologies: – Phil Barker, David Langley and Michael Menzies.

Visitor: – Jim Gordon.

In the absence of the President, The Vice-President, Mr. Bill Johnston, took the chair and opened the meeting at 20:06 hours.

Minutes of the March 2022 Meeting: – Accepted as published. James Sinclair / Andrew McLean. Carried.

Business Arising: – Nil.

Correspondence: – Nil.

Reports: – Membership renewal forms have been issued. Prompt renewals would be appreciated.

General Business: –

Chris Gordon advised that significant works at Surrey Hills Railway Station in July 2022 might disrupt the July 2022 meeting.

Andrew Waugh reported on a recent incident at Upwey where a timber carriage on a heritage train struck an overhead structure on a curve. It is understood that 50 metres of track in the vicinity of the overhead structure was lifted and packed after the incident.

Laurie Savage reported seeing trains running between Warncoort Loop – Colac today for testing of the new signalling system.

(Front cover) The need to retain access to Epping depot prevented a lengthy shutdown during constructing of the Bell and Preston grade separations. The solution was to commission a short section of single line over the new Up viaduct while the Down viaduct was being constructed on the site of the former ground level tracks. The 1:21 turnouts at each end of the temporary single line section are suitable for 80 km/h, the line speed, and so the temporary signalling does not use Medium Speed indications for diverging moves. The long point blades of a 1:21 turnout need to be driven at three points to ensure correct flexing of the point blades and correct clearances at all times. The Up end turnout, TBY072, shown here, is driven by an M23A point machine. In this case, the second and third drive points are provided by a back drive using a modern interpretation of point rodding, using T cranks and rollers. Two rods are provided to ensure that the actual drive is in tension and to eliminate problems with expansion and contraction of the rodding. Each back drive has an independent detector to ensure that precisely the correct travel has been imparted by each back drive. The turnout at the Down end of the single line is driven by a Unistar HR in-bearer point machine as its location on the embankment means that there is no room for this style of backdrive. Photo: Andrew Waugh

Laurie Savage asked when the new crossing loop at Boorcan would be brought into use. The exact date was not known however it was suggested that the loop will be in use for the next timetable alterations expected before the end of the year.

Keith Lambert provided details about various projects in the Metropolitan District. A summary of the discussion follows: –

- The new single line between Thornbury – Regent using the new elevated Up Line will be in use from 30 May 2022 to August 2022. The single line will be controlled from Epping.
- Level crossing removal works at Sunbury are in progress.
- For the level crossing removal works at Glenhuntly Road, Glenhuntly, the Down Line will be closed during July and August 2022 with only two (2) tracks in use between Caulfield – Moorabbin.
- Sidings at Pakenham are to be removed.
- The new signal control centre at Sunshine is now being used in conjunction with the testing of the Communications Based Train Control (CBTC) system between Carnegie – Westall.
- Caulfield Signal Box will be abolished and control will be transferred to Kananook Signal Control Centre.

David Stosser asked if Caulfield Signal Box will be demolished?

Laurie Savage advised that North Geelong “B” Box was demolished last weekend.

Andrew Gostling described the provision of a route indicator at Lilydale.

Graeme Henderson advised that the Moss Vale – Unanderra Line in New South Wales remains closed because of repairs to damage caused by flooding.

Bob Taaffe advised that the Mount Victoria Signal Box in New South Wales will be abolished in two (2) weeks. Control will transfer to Blacktown. Mount Victoria Signal Box is heritage listed and is expected to remain in place.

After some discussion, it was agreed that mechanical signal boxes still in use in New South Wales are: Lithgow Coal Stage, Lithgow Yard, Morisset and Bomaderry.

Rod Smith noted that earlier today all V/Line trains had stopped running because of a communications fault.

Ken Ashman described planned resignalling works at the North end of Te Rapa in New Zealand.

Judy Gordon asked when the old style black and white station signs were discontinued. It was suggested that the green with white lettering style was introduced by the Met in the mid to late 1980’s.

Syllabus Item: – The Syllabus Item was presented in two parts.

Part 1. The Vice-President introduced Member David Langberg.

David presented a demonstration of the catalogue he has built for the SRSV document collection as part of the ongoing project to scan the collection for accessing via the SRSV website. An initial bundle of 1,600 diagrams have been scanned, catalogued and loaded onto the SRSV website and are now available to view online.

Part 2. The Vice-President introduced Member Graeme Henderson.

Graeme a selection of images showing the former Upper Quadrant Signals between Jerrawa – Cootamundra in New South Wales.

Also seen were examples of other signals and infrastructure in the area at the time and a selection of trains of that era, often seen passing the signals being photographed.

The presentation also included a number of historic photos showing the facilities at Demondrille in the steam era including details of the massive coal stage.

At the completion of the presentations, Bill thanked David and Graeme for the entertainment.

Meeting closed at 22:25 hours.

The next meeting will be on Friday 15 July, 2022 at the Surrey Hills Neighbourhood Centre, Bedford Avenue, Surrey Hills, Victoria, commencing at 20:00 hours (8.00pm).

SIGNALLING ALTERATIONS

The following alterations were published in WN 14/22 to WN 21/22, and ETRB A circulars. The alterations have been edited to conserve space. Dates in parenthesis are the dates of publication, which may not be the date of the alterations.

- 07.04.2022 Borung** (TON 152/22, WN 14)
 On Thursday, 7.4., the siding was available for the stabling of track machines (it had previously been booked out due to sleeper condition). Both the Up and Down end points are available for use. TON 32/21 was cancelled.
- (12.04.2022) Southern Cross – Boundary interface** (SW 63/22, WN 14 & 15)
 Instructions were issued to clarify how worksites would be protected against cross boundary (MTM/V/Line) movements where Track Warrants may be applied after the passage of the last passenger train at night on the V/Line portion of the network. Lookouts may be used during daylight instead, provided the requirements of the Book of Rules, Section 34, Procedure 135:23 (Use of Lookouts) are implemented.
- 13.04.2022 Bendigo** (SW 69/22, WN 14)
 On Wednesday, 13.4., Stop Board 6 was relocated 100 metres in the Up direction. There is standing room of 60 metres between the baulks and Stop Board 6.
 The Wayside Monitoring Facility was brought into service. It will operate automatically when a vehicle passes the sensor located 13 metres on either side of the facility. Pulsed visible and infrared lasers are used to measure and record the wheels and brakes of V/Locity Units, and digital cameras to record images of the sides and roof for damage or missing components (such as body equipment skirts). No-one is to walk through the facility; if it is necessary to exit a train in the facility the Driver must walk through the train and exit the train outside.
 Diagram 34/22 (Bendigo) replaced 79/21.
- (19.04.2022) Southern Cross – Boundary interface** (SW 64/22, WN 15)
 Instructions were issued to clarify how worksites would be protected against cross boundary (MTM/V/Line) movements where Track Warrants may be applied after the passage of the last passenger train at night on the V/Line portion of the network. Lookouts may be used during daylight instead, provided the requirements of the Book of Rules, Section 34, Procedure 135:23 (Use of Lookouts) are implemented
- (26.04.2022) Werribee – Manor Junction** (SW 72/22, WN 16)
 Effective forthwith passenger trains, empty car trains, and light engines are prohibited from operating between 34.412 km and Manor Junction on both the East and West lines. Freight trains may operate over this section. Freight trains must respect the instructions in Book of Rules, Section 34, Clause 138, Rules 3b & 3c when approaching Browns Rd (35.341 km) and Wests Road (39.446 km).
- (26.04.2022) Bendigo** (SW 73/22, WN 16)
 Operating Procedure 117 (Bendigo – Local movements) was reissued to reflect the changes described in SW 69/22 (the provision of the Wayside Monitoring Building and the relocation of Stop Board 6). SW 225/21 was cancelled.
- (03.05.2022) Operating Procedure 133 (Axle counter operated level crossings – local resets)** (SW 89/22, WN 17)
 Operating Procedure 133 (Axle counter operated level crossings – local resets) was reissued.
 New Rules 5 & 6 were added for modified locations operated with Frauscher equipment. The indication panel at modified location has a blue background and these locations are identified by a '£' symbol on Diagrams and in the Network Service Plan.
 Rules 3, 4, & 6 were amended to note that protection equipment may continue to operate for at least 73 seconds after a reset.
 SW 189/19 is cancelled.
- 06.05.2022 Glenroy** (SW 441/22, WN 17)
 On Friday, 6.5., the grade separation at Glenroy Road was brought into use. A road overbridge for Glenroy Rd was provided at 14.177 km. A rail trench was provided between 13.912 km and 14.900 km. New 160 metre platforms were provided in the cutting.
 Automatics E503, E513, E516, E527, E532, E539, E544, E557, E560, E571, & BMS414 were abolished. Banner indicator E532BI was abolished.
 Homes GRY565, GRY525, GRY511, GRY594, GRY598, JAC505, JAC501, JAC504, JAC590, BMS529, & BMS534 were provided. Banner indicator JAC504BI was provided. Post telephones are provided.
 All new signals are equipped with TPWS. TPWS(OSS) were provided for GRY525 and BMS529. Speed proving train stop BMSU527V was provided.

Train detection is by axle counters on the Down line between 13.567 km and Home BMS529 (15.879 km) and on the Up line between 13.615 km and Banner Indicator JAC504BI (15.812 km). Axle counter resets include Supervisory reset, Next Train reset, Occupation reset, and Full counting head control.

A Westrace MkII interlocking was provided to control the signalling between 13.569 km and 16.218 km. The Signaller, Craigieburn, is responsible between Homes GRY565 & GRY598 and Broadmeadows.

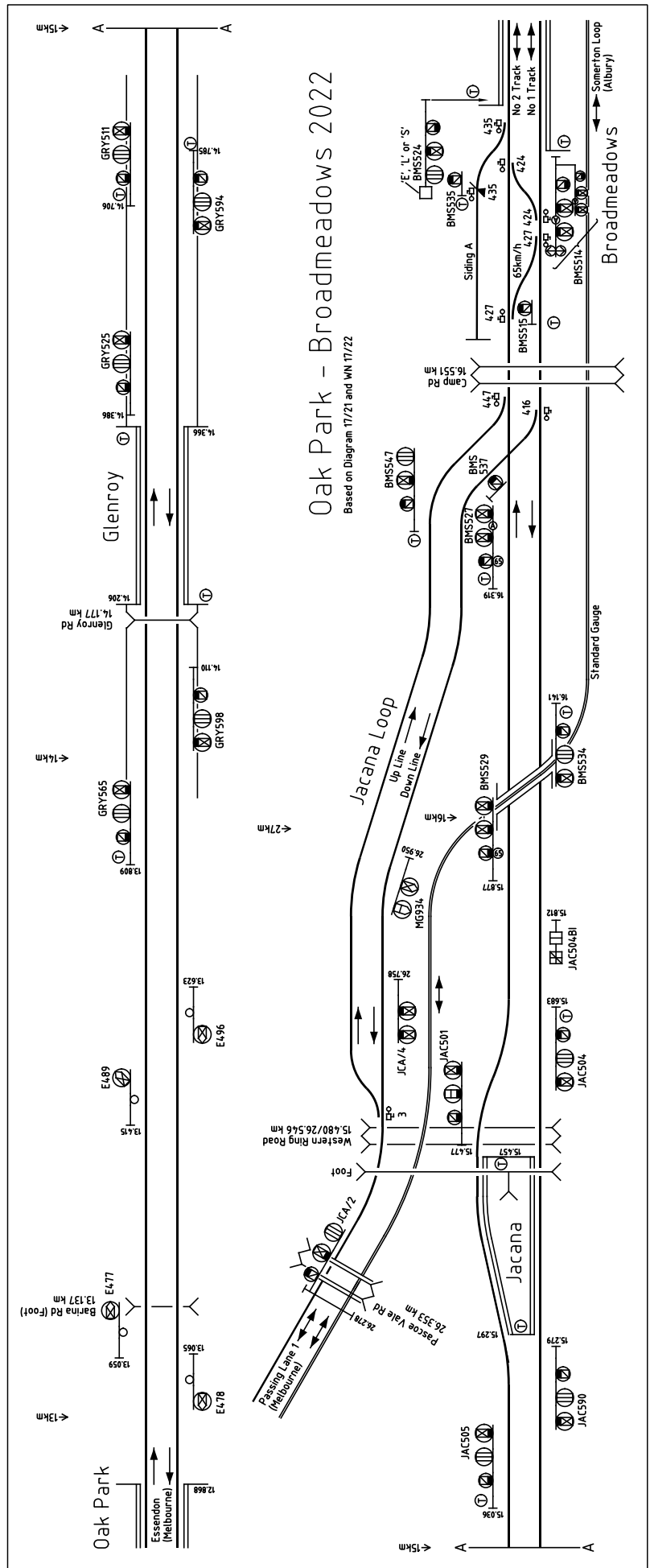
The Train Number Transmitter between Kensington and Craigieburn signal boxes was abolished, and a new PS9 TDN interface was provided. The Craigieburn WestCad and Kensington SigView were updated.

The station limits at Broadmeadows were altered and now extend on the Down line from Homes BMS529/BMD547 to Automatic E637, and on the Up line from Home BMS512 to Homes BMS534 (Main line) or Automatic MG934 (Albion line).

Circular SW 305/08 (Broadmeadows – Glenroy stopping/express mode of operation) was cancelled.

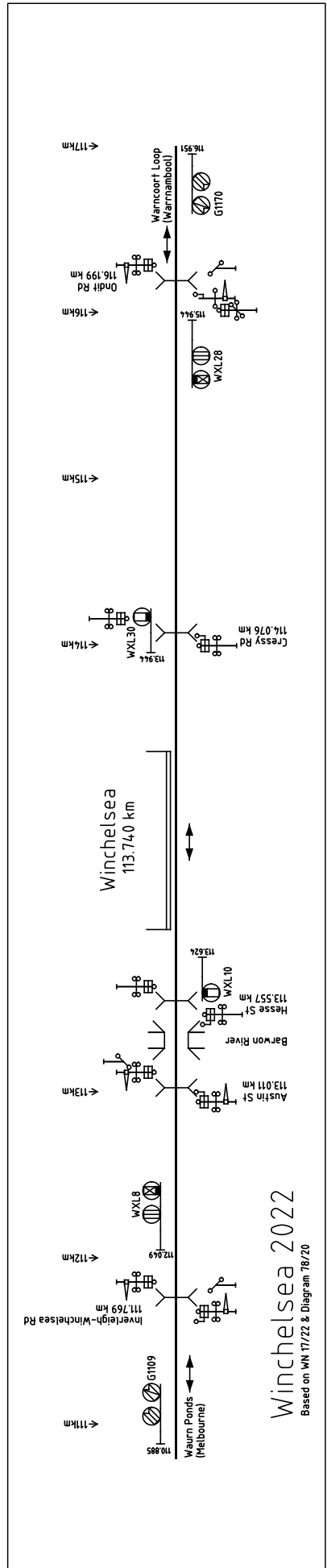
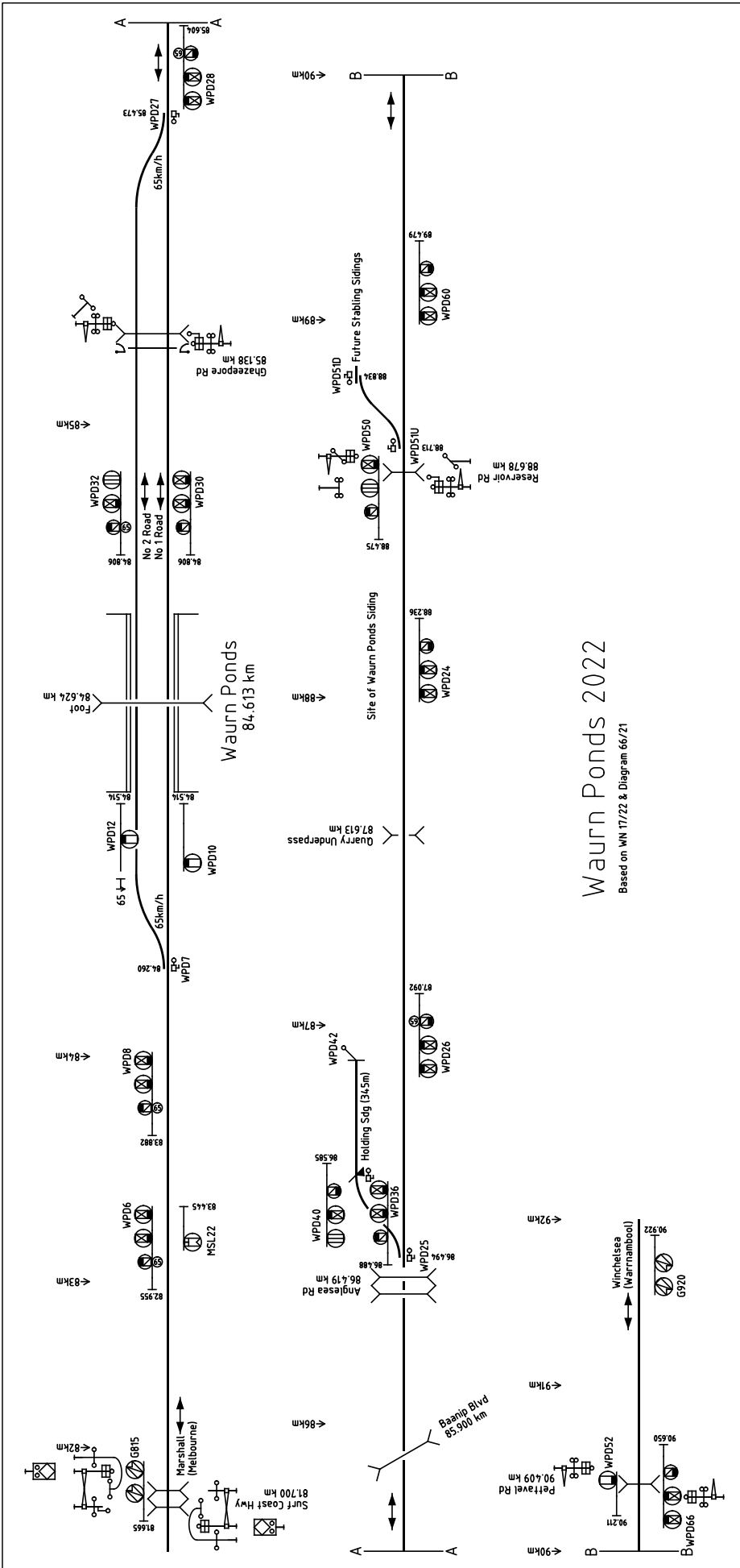
Between Broadmeadows and Oak Park Up (passenger?) trains hauled by N class locomotives between are now restricted to 70 km/h (previously 80 km/h) and Up freight trains to 40 km/h (previously 65 km/h). Down freight trains between Pascoe Vale and Broadmeadows are now restricted to 55 km/h (previously 65 km/h).

Diagrams 7/22 (Glenbervie – Somerton) & 23/22 (Albion – Broadmeadows) replaced 17/21 & 17/14 respectively.



- 08.05.2022 Calder Park Sidings** (SW 443/2022, WN 19)
On Sunday, 8.5., Points CPV638U, CPV639D, CPV640, & CPV650 will be installed (replacing straight rail kits). The points will be secured normal.
Diagram 25/22 (Watergardens – Clarkefield) replaced 67/20.
- 09.05.2022 Seymour** (SW 84/22, WN 17)
Between Thursday, 21.4., and Monday, 9.5., the following track and signal alterations took place:
- Crossover 25, leading from No 1A Road towards Nos 1 or 3 Roads, was replaced by a new crossover with a longer lead. The Up end points are located 30 metres in the Down direction from the former points, and the Down end points 88 metres.
 - Derail and Crowder 23 at the Down end of No 2A Road was replaced by Catch 23, located 3 metres on the Down side of Dwarf 20.
 - Points 25U, 25D, and Catch 23 are operated by dual control point machines.
 - Home 18 was replaced by a new mast in the same location. The new mast has no ladder or landings, and maintenance will require the exclusion of rail traffic.
- Diagram 26/22 (Seymour) replaced 20/19.
- 09.05.2022 Mangalore – Shepparton** (SW 81/22, WN 16)
On Monday, 9.5., Diagrams 30/22 (Mangalore – Nagambie), 28/22 (Murchison East – Toolamba), & 36/22 (Mooroopna – Shepparton) replaced 58/21 (Nagambie – Toolamba) & 64/21 (Mooroopna – Shepparton) as in service.
- 09.05.2022 Mangalore** (SW 75/22 & 76/22, WN 16)
Between Thursday, 21.4., and Monday, 9.5., the level crossing predictors at Oconnors Rd (109.556 km) and Aerodrome Rd (113.502 km) on the Shepparton line were replaced by axle counters. The level crossing predictor boards were abolished, and remote monitoring was provided. A reset key switch will not be provided at Oconnors Rd, and on or off tracking road/rail vehicles is not permitted at this crossing. A reset key switch was provided at Aerodrome Rd.
- 09.05.2022 Tabilk** (SW 77/22, 78/22, 79/22, & 80/22, WN 16)
Between Thursday, 21.4., and Monday, 9.5., the existing flashing lights at Avenel – Nagambie Rd (116.867 km), Tabilk – Monea Rd (119.340 km), and Nagambie – Locksley Rd (122.544 km) were equipped with boom barriers. The passive crossing at Morgan Ln (120.949 km) was equipped with boom barriers.
Operation at all these crossings is by axle counters and remote monitoring equipment was provided. Level Crossing Predictor Indicator Boards at Monea Rd were abolished. A healthy state indicator and yellow whistle boards were provided at Morgan Ln. Reset key switches were provided at all crossings (see Operating Procedure 133 (Modified Location)).
- 13.05.2022 Millbrook – Ballarat** (SW 97/22, WN 19)
On Friday, 13.5., alterations were made to prevent Down Home 56 from displaying a proceed aspect until Down Homes 40, 52, and Automatic A1147 are at proceed.
- 16.05.2022 Warncoort – Warrnambool** (SW 100/22, WN 19)
On Monday, 16.5., Corridor Master Keys 12 & 13 for the Warncoort – Warrnambool Train Order territory were relocated from South Geelong to Camperdown.
- 17.05.2022 Bell – Preston** (LXRA)
On Tuesday, 17.5., the line through Bell and Preston was temporarily closed to allow construction of the elevated line.
The existing stations at Bell and Preston were closed. The level crossings at Oakover Road (11.278 km), Bell St (11.827 km), Cramer St (12.363 km), and Murray Rd (12.633 km) were abolished. The pedestrian crossings at Showers St (11.418 km) and Bruce St (12.104 km) were abolished.
- 18.05.2022 Metrol** (SW 460/22, WN 19)
On Wednesday, 18.5., the TCMS data will be updated at the primary and disaster recovery sites to display the new signalling arrangements between Thornbury and Regent.
- 18.05.2022 Craigieburn** (SW 459/22, WN 19)
On Wednesday, 18.5., the Sunbury WestCad data will be updated at Craigieburn signal box.
- 18.05.2022 Epping** (SW 461/22, WN 19)
On Wednesday, 18.5., the SigView and Smartlock data at Epping signal box will updated in connection with the Bell – Preston level crossing removal project. The works will include extending the RES VIXL and commissioning the new TBY VIXL
- 18.05.2022 Bairnsdale - Bosworth Siding** (TON 204/22, WN 19)
On Wednesday, 18.5., a re-opening ceremony will take place.

- 19.05.2022 Rushall – Merri – Northcote (SW 456/22, WN 19)**
Between Thursday, 19.5., and Wednesday 25.5., the JZA replacement project will be installing new PLC field stations to replace the JZA field stations at Rushall, Merri, & Northcote. After completion of the work the TCMS and JZA system will remain in operation while the PLC will be running in shadow mode until the new telemetry system is brought into service.
- 20.05.2022 Book of Rules, Section 36 (SW 99/22, WN 19)**
On Friday, 20.5., Section 36 was reissued as Version 22.01. SW 50/21 (Version 21.01) was cancelled.
The following alterations took place:
- Rule 1. Tables showing where the rules apply updated to reflect alterations to the Warrnambool corridor.
 - Rule 2. Reference to 1994 Book of Rules updated to Revision 7.
 - Rule 3 (Definitions). The definition of Single Track Section updated to include Repeating Signals, and the definition of Blocking Facilities updated from Section 3 Rule 1.
 - Rule 4 (Fixed Signals). Reference to 'Uncontrolled Home Signals' altered to 'Intermediate Home Signals.'
 - Rule 6 (Single Track Section). Definition updated to reflect use of Repeating Signals.
 - Rule 6, clauses e & h. Tables for resetting axle counters updated to remove Section 34 references to Waurm Ponds and Warncoort Loop
 - Rule 6, clause i, page 22. 5th dot point updated to remove an automatic signal controlling entrance to the section.
 - Rule 6, clause m. Updated by SW 67/22.
 - Rule 11. References to replaced rules in Section 16 removed.
 - Rule 11, clause b. Intermediate signals updated to remove references to Uncontrolled Signals and reference added to Repeating Signals. Departure signals altered to reflect use of two and three position fixed signals. Intermediate Sidings. Reference to points altered to replace HLM with Electrical Release.
 - Rule 11, clause c. Home Departure Signals. Clause updated.
 - Rule 11, clause g. Section obstructed by accident or disabled train. Clause updated to align with Section 13 Rule 4.
 - Rule 11, clause h. Add reference to Section 36, Rule 11(f).
 - Rule 12, clause b. Dot point 3 updated to describe passive speed board. Dot point 5 updated to reflect active speed boards might only be illuminated by the setting of a signalled route.
- 20.05.2022 Sunbury (SW 462/22, WN 20)**
On Friday, 20.5., the Run-off track (the Up end of No 2 Road) will be reduced in length by 10 metres. Baulks will be provided.
- 21.05.2022 Waurm Ponds – Moriac BP – Winchelsea – Warncoort (SW 85/22 & 102/22, WN 17 & 19)**
Between Sunday, 1.5., and Saturday, 21.5., the section between Waurm Ponds and Warncoort was resignalled. The Train Order sections Waurm Ponds – Moriac Block Point – Warncoort were replaced by the Automatic & Track Control System with the sections Waurm Ponds – Winchelsea – Warncoort. Warncoort was established as a Train Order Terminal Station & Moriac Block Point was abolished.
- Waurm Ponds*
- A crossing loop was provided between 84.258 km and 85.473 km. The straight road (former main line) will be known as No 1 Road, and the loop as No 2 Road. Points WPD7 (Up end) and WPD27 (Down end) were provided. Both points are 65 km/h points and worked by dual control point machines. A curve board reading '65' was provided for Up trains departing from No 2 Road as the Departure signals are two position Homes.
 - A new platform was provided on No 2 Road.
 - Homes WPD6, WPD8, WPD10, WPD12, WPD24, WPD26, WPD28, WPD30, WPD32, WPD36, WPD40, WPD50, WPD52, WPD60, & WPD66 were provided. Homes WPD10, WPD12, & WPD52 are two position signals, the rest are three position signals. Down Repeating G815 and Up Repeating G920 were provided. Buffer light signal WPD42 was provided at the Down end of the Holding Road.
 - TPWS was provided at all Home signals.
 - All train detection is by axle counters. The protection equipment at Ghazeepore Rd (85.155 km), Reservoir Rd (88.678 km), & Pettavel Rd (90.409 km) were converted to axle counter operation and the level crossing predictor signage was abolished.
 - Points WPD51U and Catch WPD51D were provided on the Down side of Reservoir Rd for access to the future stabling sidings. The points are secured normal and detected in the signalling system.



- The existing two position Homes WPD6, WPD10, WPD14, WPD22, WPD24, & WPD26, Distant WPD4 & WPD28, and the Down two position Automatic at Reservoir Road were abolished.
- The notice board applying to Down trains departing from Waurn Ponds station was abolished.
- The Start and End Train Order Working boards opposite WPD26 were abolished. The Up and Down end points for the former Waurn Ponds Cement Siding were abolished, together with the catch points in the siding. The small point levers, rodded connections, duplex locks, & Annett keys were abolished. The key switches for the manual operation of the Down Automatic at Reservoir Rd were abolished.

Moriac Block Point

- The Block Point was abolished. The block point signs at 98.000 km and Up and Down location boards were abolished.

Winchelsea

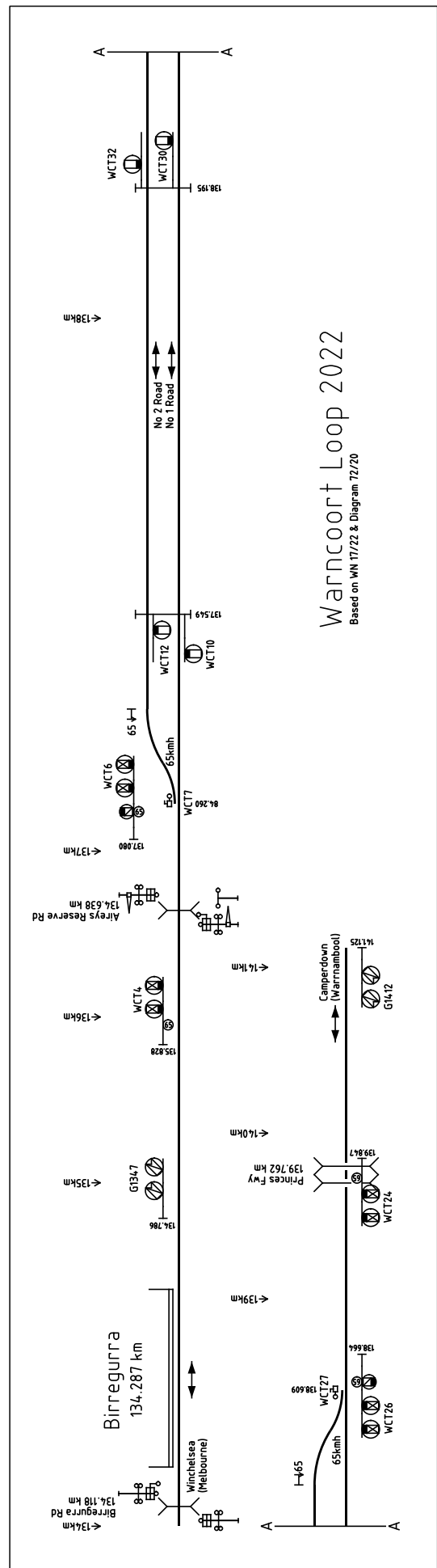
- The Up and Down two position Automatic signals were abolished, together with the key switches at the Up and Down ends of the platform.
- Homes WXC8, WXC10, WXC30, & WXC28, and Repeating Signals G1109 & G1170 were provided. WXC10 & WXC30 are two position Homes, WXC8 & WXC28 are three position
- TPWS was provided at all Home signals.

Warncoort

- Homes WCT6, WCT10, WCT12, WCT26, WCT30, & WCT32 and Repeating Signals G1347 & G1412 were redressed (the existing signal heads and '65' indicators, where provided, were renewed).
- New Homes WCT4 & WCT24 were provided.
- Start and End Train Order Working boards were provided at Home WCT24.
- TPWS was provided at all Homes.
- The Departure Homes WCT10, WCT12, WCT30 & WCT32 are two position signals. Curve boards showing '65' are provided for movements out of No 2 Road at both ends. The remaining Homes are three position.
- The emergency 5P key switches opposite the signal bridges for Homes WCT10, WCT12, WCT30, WCT32 were abolished. The emergency automatic mode for the arrival of trains (Operating Procedure 56) was abolished.
- The local signalling VDU in the Signal Equipment Room was abolished.

Centrol

- The existing SigView VDU for the control of Marshall, Waurn Ponds & Warncoort Loop was replaced by a 'Downer InControl' VDU for the control between Marshall and Warncoort.



Diagrams 10/21 (Marshall), 66/21 (Wauron Ponds), 78/20 (Moriac – Winchelsea) & 72/20 (Birregurra – Colac) replaced 46/19, 44/21, 52/20, & 16/20 respectively.

- 22.05.2022 Wauron Ponds – Warncoort (SW 107/22, WN 20)**
 Operating Procedure 56 (Wauron Ponds – Winchelsea – Warncoort) was reissued. SW 159/15 was cancelled.
 Operating Procedure 64 (Wauron Ponds) was reissued. SW 113/16 was cancelled.
 Operating Procedure 131 (Train Order Territory) was reissued. SW 145/21 was cancelled.
- (24.05.2022) Ballarat East (SW 109/22, WN 20)**
 Operating Procedure 73 (Ballarat East Locomotive Depot) was reissued. The changes relate to the Wayside Monitoring Facility. SW 6/22 is cancelled.
- 24.05.2022 Mooroolbark (SW 476/22, WN 20)**
 On Tuesday, 24.5., signal post telephones were commissioned at or for Homes MLK312, MLK313, MLK320, MLK321, MLK330/332, & MLK351.
- 24.05.2022 Lilydale (SW 476/22, WN 20)**
 On Tuesday, 24.5., the theatre type route indicator on Home LIL350 was commissioned. It will display 'U' when the route is set into the Maintenance Siding (unwired), and 'S' when the route is set into Sidings 6 & 7.
 Signal post telephones were commissioned at or for signals LIL260, LIL292, LIL341/343, LIL342, LIL348/350, LIL353, LIL369, & LIL393.
- 28.05.2022 Geelong – Warrnambool (TON 227/22, WN 21)**
 On Saturday, 28.5., and Sunday, 29.5., TCS upgrades were carried out in Rooms 1 & 8 Centrol.
- 30.05.2022 Watergardens (SW 488/22, WN 21)**
 On Monday, 30.5., the siding access maintenance crossing was abolished. The boom barrier arms and motors were removed and temporary circuit alterations were made to ensure detection. Temporary barriers were provided at the crossing. If it is necessary to use the crossing for plant, vehicles or RNA pedestrians, access must be arranged with the TFPC and the appropriate method of track protection applied to cross the Down Sunbury line.
 A new maintenance crossing will be commissioned in conjunction with the final signalling arrangements.
- 30.05.2022 Thornbury – Regent (SW 283/22, SWP 2/22, WN 20)**
 On Monday, 30.5., the elevated Up line will be brought into service between Thornbury and Regent as a single line, and the existing double track ground level lines were abolished. The viaduct extends between 11.107 km and 12.917 km. The new stations at Bell and Preston will not be opened.
 The single line will be worked under the rules for Automatic Block Signalling (ABS) system. It will be controlled from the Epping panel at Epping signal box.
 Homes TBY125, TBY166, TBY172, BEL141, BEL145, & PRE184 were provided. Banner Indicator TBY166BI was provided.
 Automatic T280 was renumbered TBY025.
 The aspects on Up Home RES181 were modified. It will not display a warning indication. Instead, the Clear Normal Speed indication requires a proceed aspect on Up Home BEL 145.
 Points TBY072 & PRE084 were provided. Both are 1:21 turnouts suitable for 80 km/h over the diverging route. TBY072 is equipped with an M23A dual control point machine, and PRE084 with an in-bearer point machine.
 The crib crossing at Smith St (10.406 km) on the Up side of Thornbury was provided with automatic pedestrian gates.
 SPAD mitigation is provided in the Up controls for Hutton Street, Thornbury. The level crossing protection equipment will commence to operate if no route is set from Home TBY125 when an Up train approaches. The protection equipment will cease to operate after a time out, provided no route is set past TBY125 and no Down train has entered the control or holding sections.
 Homes BEL102, BEL107, BEL108, BEL111, & BEL113, Automatics T285, T300, T305, T310, T315, T330, T351, T365, T376, & T379, and Banner Indicator BEL111BI were abolished.
 The 5P level crossing control switches at Thornbury (Automatics T300 & T305), Bell (Homes BEL107 & BEL108) and Preston (Home BEL113 & Automatic T365) were abolished.
- (31.05.2022) Thornbury (SW 484/22, WN 21)**
 Commencing forthwith, the station access pedestrian crossing (10.775 km) at the Down end of Thornbury platform was closed as part of SPAD mitigation works during the single line working.



More photos from the resignalling associated with the provision of the single line viaduct between through Bell and Preston. (Above left) The Down outer Home signal protecting the single line, TBY166, is situated well south of Thornbury. Although the Home is situated in roughly the same location as a previous Automatic, the sighting of the Home is badly obstructed by the overhead structures. A banner indicator, TBY166BI, is consequently provided on dead straight piece of track. (Below) Another view of Home TBY166/Banner Repeater TBY166BI with the road set through the single track section, but the with entry Home into the section at stop. If the Signaller had only set the route into Thornbury platform, but not into the single track section, Home TBY166 would show Medium Speed Warning. (Above right) The new style of signal post telephones that are appearing around the Metropolitan area. (Photos: Andrew Waugh)



31.05.2022 Donald (SW 112/22, WN 21)

On Thursday, 31.5., the key switches for the manual control of the level crossings at Campbell St (337.265 km) and Hammill St (337.931 km) were replaced by three position unit levers mounted in locked cabinets. At Campbell St the cabinet is mounted on a post, and at Hammill St the cabinet is mounted on the side of the crossing location box.

The unit lever has three positions ('Start' - (Centre) - 'Stop') and is spring loaded to return to the centre position. To start the level crossing the lever is turned to the 'Start' position and released. The level crossing will track cancel when the movement clears. The lever can be turned to the 'Stop' position to cancel operation of the level crossing.

Amend Diagram 92/19 (Sutherland - Watchem).

01.06.2022 Metrol Signal Post Telephones (WN 21)

Over the month of June, the signal post telephones connecting to Metrol will be progressively moved to the new ACOM system.

01.06.2022 Sunbury (SW 489/22, WN 21)

On Wednesday, 1.6., the Gap Road crossing was permanently closed for vehicle and pedestrian traffic.

The level crossing and pedestrian crossing will be removed and temporary circuit alterations made to ensure detection. Barriers were installed to prevent access to the crossing.

Signallers must select express for all routes on the WestCad TCS until the interlocking and WestCad data is updated.

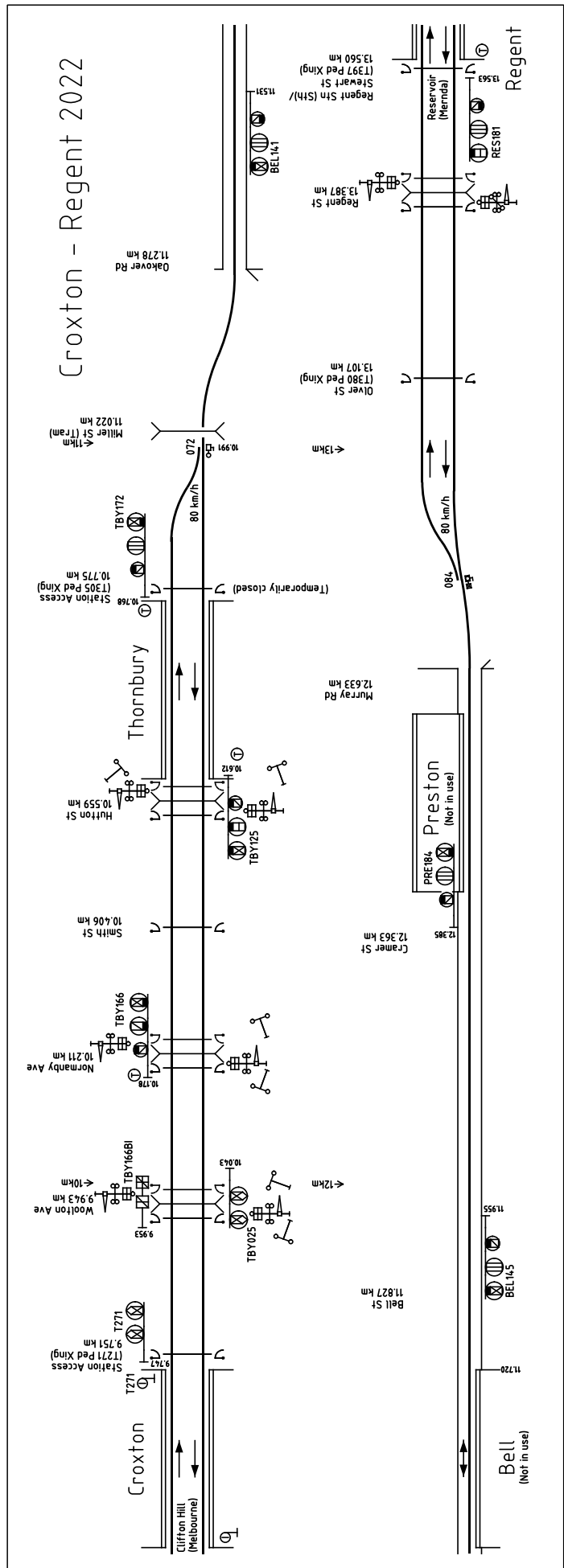
(07.06.2022) North Melbourne (SW 122/22, WN 22)

Diagram 22/22 (Moonee Ponds Creek) replaced 70/20 due to the alterations in SW 23/22.

12.06.2022 Rochester (TON 262/22, WN 24)

On Sunday, 12.6., the Down end points were booked out of service because the small point lever was not securely fastened to the point timbers.

End£



THE DEVELOPMENT OF THE US TRAIN ORDER SYSTEM

(Continued from Vol 45 No 3)

Standardisation of the timetable and train order system

The post civil war period was one of great traffic growth on the US railroad network, and railroads, having grown used to train order operation, continued to use the system. However, there was no systematic evaluation of different systems, rather, each railroad extended their own rulebook to include train order operation. There were consequently no uniform train operation rules across the industry.

Schwantes identifies two ways in which this lack of uniformity became a safety issue during the 1870s and 1880s. The first was industry consolidation, where larger railroad companies purchased or leased smaller companies to create larger networks. The result was that companies had multiple rulebooks and practices with consequent problems when staff on the consolidated railways operated beyond their original line. The second involved trackage rights; where trains from one company were granted permission to run on the lines of another company. The result was a similar problem; train crews operating trains on the foreign road would usually be using completely different rules and practices. However, the resolution was even more difficult. When railroads consolidated, the new company could impose a uniform rulebook and practices. This was not possible where a company just used the tracks of another.

There was a third issue, not touched on by Schwantes, but which appeared as significant if not more so. This concerned the employment practices of the railroads. The traffic handled by railroads was subject to considerable fluctuations. The railroad companies did not retain staff to handle traffic peaks. Instead, they hired additional staff to handle the peaks and discharged them again when traffic fell. This resulted in the creation of 'boomers'; staff that moved from railroad to railroad as traffic ebbed and flowed. At each hire boomers had to pick up a new rulebook and operating practices that may have been

completely different to the last railroad they worked on. The safety implications are obvious. When the newly formed American Train Dispatchers' Association sent representatives to the General Time Convention in October 1885, this was the specific problem noted: "The discussion on the subject showed that rules worded in the same form would be interpreted in own way on one road, and in another way on others. Train men leaving one road, and entering the employ of another, were apt at times to give the first meaning they had attached to the rule"¹.

In the early 1880s work began on standardising the rules for whistle, bell, and hand signals². The impetus seems to have been a letter in the Railroad Gazette in 1881 from Edwin Hill. He suggested a code of uniform hand, bell-cord, and whistle signals and produced a table showing the diversity of those in use on 36 leading railroads³. The effort was supported by the Railroad Gazette, who then published a follow-up table showing the bell and whistle signals used in 198 railroads. This table was compiled by the William F. Allen, editor of the 'Official Railway Guide'⁴. At this time, railroads published their operating rules on the back of their employee time-tables. Copies of these time-tables were sent to the offices of the Official Guide as they were issued for inclusion into the Guide⁵, and Allen was consequently in a unique position to appreciate just how disparate US practice actually was.

The new and short lived Association of American Railroad Superintendents set up a committee in August 1881 to consider the issue. This committee reported on a proposed code of whistle, bell, and 'lamp, hat, and hand' signals in October 1882⁶, but no direct action resulted.

The General Time Convention⁷ followed, setting up a committee on a uniform signal system at its April 1883⁸ meeting under James McCrea, General Manager of the Pittsburgh, Cincinnati & St Louis Railroad⁹. The other three members of the committee were the general managers of the Missouri Pacific, the St Louis, Alton &

¹ ARA Proceedings, v1 p737

² Note, not fixed signals. Fixed signals were scarcely in use in the US at this time.

³ Railroad Gazette 4 February 1881 p64. Note that there was no suggestion to standardise fixed signals. Most US railroads had no fixed signals at all at this time.

⁴ This was the equivalent of Bradshaw in the UK. Published monthly it was a compilation of the passenger time tables of all US railroads.

⁵ Yes, I'd like that collection of timetables to be still in existence too.

⁶ Railroad Gazette 30 August 1881 p537, 21 April 1882 p241, 28 April 1882 p252, 20 October 1882 p651, & 27 October 1882 p666

⁷ The General Time Convention was formed in 1872 to 'arrange for the moving of through trains between Eastern and Western points, and the determination of the date for making general changes in time schedules' (Proceedings of the General Time Convention and its successor The American Railway Association from its organization April 14, 1886 to October 11, 1893, p3). A separate convention, the Southern Time Convention, was formed

in 1877 for the broad gauge (5'0") Southern lines. In 1886 the two conventions were merged as the 'General Time Convention'. From this time membership of the convention was restricted to railroads, and the roads were represented by very senior officers; typically General Managers, Superintendent of Transportation, General Passenger Agent, etc. The General Time Convention was renamed 'The American Railway Association' in 1891 and to the 'Association of American Railroads' in 1934. The organisation still exists under that name today. (See entry for 'Assn of American Railroads (AAR)' in 'Encyclopedia of American Railroads', ed William D. Middleton, George M. Smerk & Roberta I. Diehl, Indiana University Press, 2007.

⁸ Railroad Gazette 13 April 1883 p237. It should be noted that the Secretary of the General Time Convention was William Allen, who prepared the initial report in 1881. Apart from the routine work of agreeing on timetable alterations, the main action of the convention in 1883 was reaching agreement on standard time zones across the US. This work was largely driven by Allen.

⁹ A subsidiary of the Pennsylvania Railroad.

Terre Haute, and the Cleveland, Columbus, Cincinnati & Indianapolis RR. The committee presented a report to the following convention in October 1883 which was printed for comment by the member railroads¹⁰. The proposal was debated over the next year; the major sticking point was that it virtually reproduced the signals used by the Pennsylvania Railroad¹¹ and its subsidiaries. However, most participants were more concerned with commonality and less about the source of the signals. The convention of October 1884 adopted the proposed signals¹² - of the membership 116 railroads voted for the signals, 30 rejected them, and 97 would consider them if connecting roads also adopted them. The uniform signals were, in fact, quickly adopted.

With that success under their belt, the General Time Convention immediately established a committee on "uniform telegraph orders and general rules for governing train service" in October 1884¹³. The members of the committee were K.H. Wade (Supt Transportation, Wabash, St Louis & Pacific RR), Henry B. Stone (Asst General Manager, Chicago, Burlington & Quincy), J.T. Harahan (General Manager, Louisville & Nashville), C.D. Gorham (General Superintendent, Northern Central RR), and Robert Pitcairn (General Agent & Superintendent, Pittsburgh Division, Pennsylvania RR). The seniority of the members of the committee is to be noted, as is the diversity of the railroads represented, both in terms of size and location.

As was becoming common practice, the committee commenced by surveying US railroads on their practice. The results were summarised at the April 1885 meeting¹⁴. In the October 1885 the committee reported that they believed that a general code was possible, but "such a code cannot be prepared without long and careful examination and investigation of the best practice on well managed roads and the most explicit forms of expressing the same."¹⁵

The comment about examining practices on "well managed roads" is to be noted, and once again the Pennsylvania Railroad took the lead. Schwantes notes that the Pennsylvania had revised its rulebook between 1880 and 1882, under the influence of Superintendent John H. Anderson. Anderson had taken a lead in developing a theory of Train Order systems.¹⁶ Anderson did not get his way with the Pennsylvania in 1882, but he published his thoughts on the train order system in "The Train Wire: A

discussion of the science of train despatching" in 1883. Wade invited Anderson to participate as a "guest" in the committee when considering train order working to share his knowledge of train despatching. As a result, Anderson's ideas heavily influenced the committee and its rules.

The new focus of the Convention on standard time and operating practices changed the General Time Convention. In October 1885 it was resolved that the convention "take up, discuss, and formulate recommendations upon such general subjects of mutual interest to the operating departments of our railway lines as may be brought before it."¹⁷ One immediate consequence of this new focus was that, at the next meeting in April 1886, the General Time Convention and the Southern Time Convention amalgamated under the name of "General Time Convention".

Even before the formal amalgamation of the two conventions the Southern Time Convention had nominated William Rogers (General Manager, Central Railroad of Georgia), H Walters (General Manager, Atlantic Coast Lines), and E.B. Thomas (General Manager, Richmond and Danville Railroad System) to work with the committee on operating rules¹⁸. Under the new combined Convention, the committee was reformed in April 1886 with the following members: Wade, Thomas, Stone, Walters, Harahan, Rogers, Gorham, & Pitcairn¹⁹.

The report of the committee on General and Train Rules was presented to the Convention in October 1886²⁰, which debated the proposed rules rule by rule (the discussion extended for no less than 35 pages of the printed proceedings). However, time had not allowed the completion of the "Rule for the movement of trains by telegraphic orders." This division again reflected the development of railroad operations noted by Schwantes. The 'General and Train Rules' contained the rules for operation of trains by timetable, while the second set would contain the extension for operation by train orders.

The committee was at pains to note that the draft rules had been examined by several legal departments, and after each meeting of the subcommittee, the current draft rules had been set in type and submitted to a range of railroads, with a range of characteristics, for comments. It is

¹⁰ Railroad Gazette, 19 October 1883 p685, 2 November 1883 p717-9 & 7 December 1883 p803-4

¹¹ McCrea was a long term PRR employee, and the PC&StLRR was a PRR subsidiary. However, the Missouri Pacific was owned by Jay Gould, and the Cleveland, Columbus, Cincinnati & Indianapolis RR by Vanderbilt interests.

¹² Railroad Gazette, 31 October 1884 p784-5, 7 November 1884 p808

¹³ Proceedings of the American Railway Association, Volume 1, p718

¹⁴ ARA Proceedings, v1 p725-. The survey results were expressed as road mileage, rather than number of railroads. This emphasised, of course, the practices of the major roads over those of the minor railroads. The report stated that the number of roads

replying operated over 80,000 miles of road, but nowhere is the number of railroads replying is given.

¹⁵ ARA Proceedings, v1 p736

¹⁶ Anderson published an article on "Rules for the Movement of Trains by Telegraphic Train Orders" in the Railroad Gazette in 1873. He published a series of articles in the Railway Age in 1882, and these were republished as "The Train Wire: A discussion of the science of train despatching" in 1883.

¹⁷ ARA Proceedings, v1 p737

¹⁸ ARA Proceedings, v1 p3

¹⁹ ARA Proceedings, v1 p7. The proceedings listed the members in that order; note the careful alternation of members from the former General Time Convention & the Southern Time Convention.

²⁰ ARA Proceedings, v1 p12 et seq

interesting that the only advantage of a uniform rules highlighted in the covering report was legal:

The investigations of your Committee have developed the fact that in many States[,] Railway Commissions have undertaken to criticise and condemn many of the rules in force for the operation of railways, even upon the best managed lines. The tendency of such Commissions, as well as of State Legislatures, in the direction of formulating rules and regulations which shall conform to their ideas of railway management, however these may vary from the best judgment of experienced railway officers. Juries also are prone to construe, to the detriment of railway interests, any assumed weakness in running rules or telegraph instructions. The fact of the existing want of uniformity in rules has been frequently used before juries, to show that an accident upon one railway might have been prevented by the use of a rule in force upon some other railway, even though the rule in question has successfully borne the strain and stress of long-continued usage. This, with the growing tendency of Railway Commissions to condemn any practice to which they attribute the cause of an accident, and their frequent findings that the practice of some other railway or the adoption of some rule of their own formulation would, in their opinion, have prevented such an accident, often renders successful defence extremely difficult. These facts impressed upon your Committee the grave importance of the work undertaken.

Few of the members of the various Railway Commissions or of the State Legislatures, no matter how well versed or expert they may be in other lines of business, have had any practical experience in the actual operation of railways – a business which is as technical in its character as the practice of law or of medicine. The difficulties under which these public officials have labored under such circumstances can be readily appreciated. Your

Committee believes that the adoption of a Uniform Code of Rules will do much to relieve Railway Commissions from the pressure to which, under the circumstances, they have heretofore perhaps unwittingly yielded.²¹

The second draft of the Code of General and Train Rules was discussed at the April 1887 meeting²², and the first draft of the 'Rules for the movement of trains by telegraphic orders'. Again, the rules were gone through clause by clause. Both were approved – the General and Train Rules being finally approved to take effect (49 railroads represented at the Convention to 5), with the Telegraph Rules being provisionally agreed.

The October 1887 meeting saw some minor tweaking to the Code of General and Train Rules, and the adoption of the Telegraph Rules²³.

Of this sequence, Schwantes makes a couple of comments. The first is to highlight the influence of Anderson on the form of the Telegraph Rules, and the PRR (the new Rulebook was apparently similar to that of the PRR). The second was the improvement in safety as the standard rulebook was widely adopted.

Schwantes also noted resistance to the new rulebook from railroads, and officials, that used old, simpler, forms of train working. This resistance centred around the use of double order versus single order train order systems²⁴. It is important not to overstate this resistance within the large railroads represented at the convention itself. When reading the debates, it is notable that there was almost no debate over the principles underlying the new rules. The focus was invariably on the details of how the rules would work. Debate about the issue of single and double order rules (and the complexity of the new train order rules generally) only occurred at the very end of the convention and only involved one person: C.D. Hammond, Superintendent of the relatively small road the Delaware and Hudson Canal Company²⁵. It is notable that Hammond had no personal experience as a train dispatcher, and his arguments were easily countered by the members of the committee who had²⁶.

(To be continued)

²¹ ARA Proceedings, v1 p13

²² ARA Proceedings, v1 p64-99

²³ ARA Proceedings, v1 p122-33, 136-40, 143-56

²⁴ In a "single order" train order system the dispatcher issued unique orders to each train as required – as is done in all Australian Train Order systems. In a "double order" (or "duplicate order" system), each train affected by an order received exactly the same order, in exactly the same words, and all these copies were issued, as far as possible, at the same time in the one process. The advantage of the single order system was claimed to be flexibility, while the double order system was considered safer (as train dispatchers could not issue inconsistent orders) and quicker (as issuing a single order to multiple offices at one time occupied less time than multiple orders individually). The single order system was the older, and probably the more common. Anderson had popularised the double order system in his "Train Wire". For examples of how the single and double order system compared, see The Railroad Gazette, 10 January

1890 p20-1. As late as 1922 the ICC investigated a collision on the Utah Railroad near Martin, Utah, that was caused by the dispatcher using the single order system. The railroad rulebook was based on the standard ARA rulebook, but this was apparently ignored on the division.

²⁵ The Delaware and Hudson Canal Company originally built a very successful canal (opened in 1828) from the Hudson River into the anthracite coal fields in Philadelphia. Railroad feeders were built right from the start, and the company operated the first locomotive in the US. The company pivoted away from canal operations in the late 1860s to meet competition from other railroads. The canal was closed in 1898, and the company changed its name to the Delaware and Hudson Railway in 1899. (Wikipedia entry for the Delaware and Hudson Railway)

²⁶ One notable feature of the debates was absolute politeness of the debaters. Hammond clearly stated his lack of experience as a dispatcher, and the committee politely rebutted his points.

LATTICE MAST POSTS

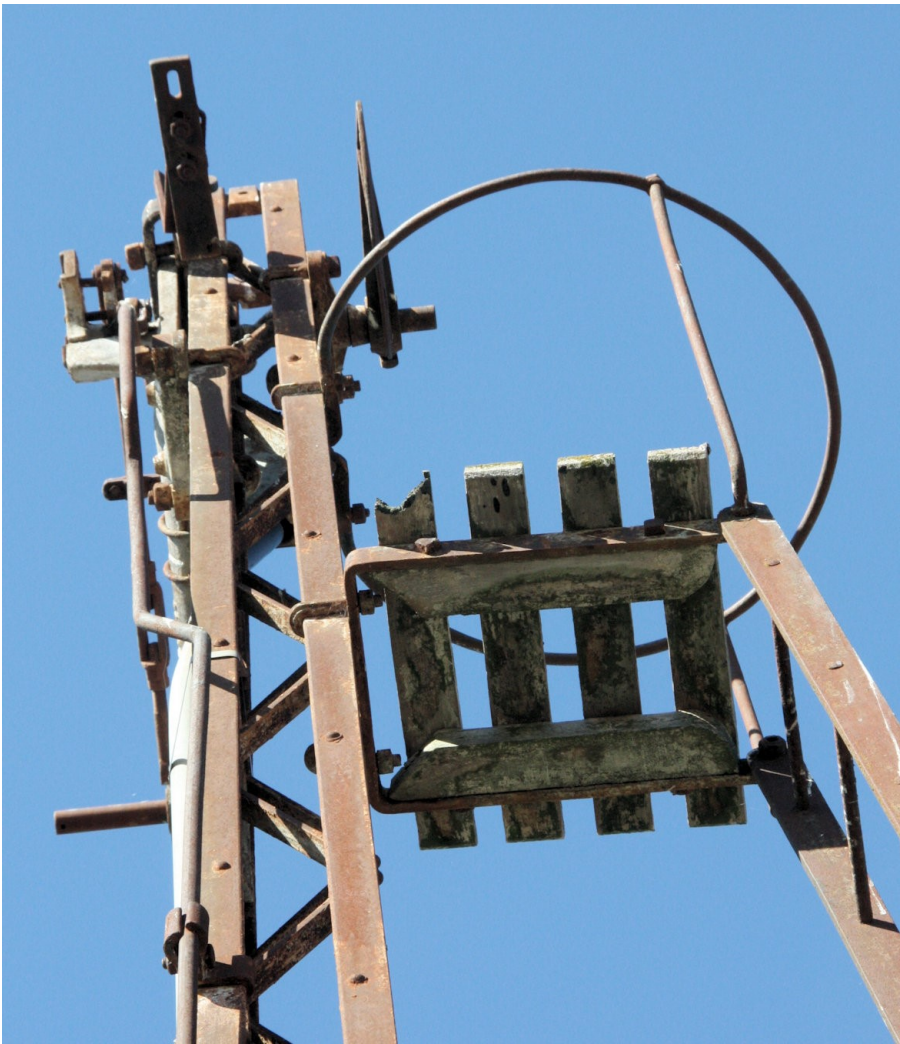
(Continued from Vol 45 No 3)



Every signal mast required access to service the signal mechanism and the lamp. In Victoria the Traffic Branch required that the kerosene signal lamps be removed from the mast each day after dawn, cleaned of soot, refilled, and replaced on the mast prior to dusk. They adamantly refused to change this policy even after Adlake 'long-burning' lamps were introduced – these lamps were specifically designed to burn for a week without requiring attention.

To provide access to service the signal, especially the lamp, every signal mast was provided with a platform, hoop, and ladder. On straight lattice masts the platform and ladder were placed at the rear of the mast, as seen here with the two Up Home signals at Strathmerton.

The mast on the left was for the Tocumwal line and was a standard lattice mast. The mast on the right, for the Cobram line, was non-standard lattice mast with the vertical angles positioned with their angles towards the centre of the post. This was probably a McKenzie & Holland design, and was used in Queensland. Both Home signals were out of use when this photo was taken, and are nearly devoid of paint.



(Left) A close-up of the top of the Up Home from the Tocumwal line at Strathmerton showing the construction details of the standard top of mast landing.

The basis of the landing is a U shaped steel frame that is secured to the mast using two hook bolts. Dropped into this U frame is the wooden deck which consists of two wooden supports bolted to the frame and four decking slats. The top of the decking is 3'6" below the centre line of the arm (the hook bolts were 2½" below that).

The handrail is of 5/8" diam steel rod bent in a circle 24" in diameter. The hand rail is clipped to the mast at the front, about 15" below the centre line of the arm, and is supported at the rear by two supports. The lower end of each support is a horizontal bolt that ties the U frame, the support, and the ladder together.

There are two very slightly different handrail hoops – one each for the different size of angle at the top of the mast.

(Below Left) The problem with the wooden decking was that it was slippery when wet and rotted. Sometime around the 1990s the wooden decking was replaced by steel grating that was welded to the U frame. The new style of decking was retrofitted to all masts still in service at that time.



If you look carefully at the picture of the two masts at Strathmerton, you can see that the decking of the Cobram Home has been renewed with the steel grating, but the Tocumwal Home was not. At the time of the renewal the Cobram line was in use, but the Tocumwal line had its services suspended. Later the Tocumwal line was reopened, but the signalling at Strathmerton was out of use by this time.

This mast is the Up Home from Deniliquin at Barnes.



On both the drawings, and on the measured masts, the steel ladder used on a straight post was 12" wide, and was constructed of two steel flats, 2¼" by 3/8". The width of the ladder was fixed by the U frame for the landing. The rungs were 5/8" diam steel rod situated 12" apart. Originally, as shown in all of these photographs, the rungs were placed in holes drilled in the verticals and the ends rivetted over. By 1962 (and possibly as early as 1941) the rungs were welded into the verticals.

On most masts the ladders at least one stay was provided to brace the ladder. The photo at the left shows the standard stay used on the older masts. Very little is known about these stays – for example, did they come in standard lengths? From at least 1941 the stay was a simple steel flat 1 ½"x1/4" clamped to the mast and bolted to the ladder. Note that in both cases, the width of the ladder and the width of the mast would differ.

As far as I have noticed, ladders were stepped into this cast iron foundation. However, the first known drawing for this style of foundation, F1242, was for 10" wide ladders and was dated December 1921. A faint annotation on a copy of this drawing suggests a similar foundation for a 12" ladder was subsequently developed. By 1941 the standard foundation was 2A4915.

This photo is of the foot of the ladder of the Up Deniliquin Home at Barnes. The signal mast probably predates 1921, and it can be seen how the foot of the mast has been crudely shaped (in the field?) to fit the socket at the top of the foundation.

