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The strange sight of signals above a derelict track bed at Wodonga Coal Sidings on Queens Birthday weekend 2012. This photo looks south with the former standard gauge line on the left and the broad gauge on the right. The junction for the Bandiana line was just beyond the level crossing in the middle distance, while the main lines curved sharply to the right to Wodonga station. As can be seen, the track has been almost completely lifed, but the sleepers on the former standard gauge are mostly in place. All the signal posts are intact, although the searchlight mechanisms have probably been removed. Behind the camera, the Wodonga Coal Sidings signal box was still standing, but striped of equipment (and window glass). Wodonga A box was also standing when this photo was taken, but it was demolished early the following week as part of the redevelopment of the Wodonga station yard. Photo: Andrew Waugh

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Minutes of Meeting held Friday 18 May, 2012, at the Surrey Hills Neighbourhood Centre, 1 Bedford Avenue, Surrey Hills

Present: - Phil Barker, Wilfrid Brook, Brett Cleak, Graeme Cleak, Glenn Cumming, John Dennis, Mike Drew, Graeme Dunn, Steven Dunne, Vance Findlay, Michael Formaini, Ray Gomerski, Chris Gordon, Judy Gordon, Andrew Gostling, Bill Johnston, David Jones, Chris King, Keith Lambert, David Langley, Bruce McCurry, Andrew McLean, Tom Murray, Colin Rutledge, Brian Sherry, Peter Silva, Rod Smith, David Stosser, Andrew Waugh, Rob Weiss, Andrew Wheatland and Ray Williams.

Apologies: - Jon Churchward, Steve Malpass, Greg O'Flynn, Laurie Savage, Stuart Turnbull and Bob Whitehead.

Visitors: - Jim Gordon.

The President, Mr. David Langley, took the chair & opened the meeting at 20:25 hours, following the conclusion of the 2012 Annual General Meeting.

Minutes of the March 2012 Meeting: - Accepted as published. Bill Johnston / Graeme Dunn. Carried.

Business Arising: - Nil.

Correspondence: - Letter from Jim Black requesting that tonight's Syllabus Item be published in "Somersault". Michael Formaini / David Stosser. Carried.

Reports: - Glenn Cumming asked for suggestions for a signal box tour.

General Business: - Glenn Cumming noted a media report that "all signals were out" between Laverton - Werribee for today's morning peak. Additional details provided were that a 50-core cable lying on the ground between Aircraft - Hoppers Crossing had been cut.

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

* The transfer of control of Sydenham to Craigieburn had been postponed until late June 2012.
* There will be a nine day shutdown of the Sunbury Line in late July 2012 for works.
* The commissioning of the new connections at Newport South have been postponed due to a lack of funding.
* The Darling - Glen Waverley Line will be closed for nine days in late July 2012 to allow concrete sleepers to be inserted.
* A new computer based interlocking for Greensborough will be commissioned in September 2012.
* ATC to Diamond Creek will be commissioned in November 2012.
* In April 2013, the Flemington Racecourse Line will be closed for 14 days for major works including signalling works.
* A new computer based interlocking for Kensington will be commissioned mid-2013.
* Works on the Richmond - Caulfield Line this weekend will concentrate on mud spot removal.
* At Caulfield during the morning peak, only one set of points is used between the Up Moorabbin Centre Line and the Up Moorabbin Local Line.

Tom Murray reported that recently the train staff for the Eltham - Diamond Creek section became jammed in one of the ticket boxes for the section. The staff travelled with the ticket box attached on each train until the defect was rectified.

Andrew Wheatland reported that the Metrol replacement project was still progressing. A new operating floor has been constructed. Trials of the new Metrol might commence before the end of 2012.

David Langley asked if anybody knew what model of Westinghouse power frame was used at Flinders Street "D" Box? Colin Rutledge undertook to investigate.

Rod Smith noted that there had been eight expressions of interest in the high density signalling project advertised recently.

Rod Smith reported that some suburban lines in Adelaide had been closed for up to six months for major works.

Chris King reported on a recent incident at Glenroy where a defective train had caused the boom barriers to stay down. The train driver was unable to use the 5P keyswitch to raise the boom barriers because the 5P keyswitch had been removed.

Chris King asked why the signalling works between McIntyre Loop - Tullamarine Loop had not been completed. It is believed that a funding shortfall was to blame.

Colin Rutledge provided details about various works in the Country Districts. A summary of the discussion follows: -

* Shepparton is now remotely controlled from Centrol.
* It is proposed to provide a computer based interlocking at Echuca.
* The Ballarat - Maryborough signalling project is progressing slowly.
* At Broadford, the Up platform was rebuilt due to narrow track centres.
* West Tower Signal Box will be abolished in the first week of July 2012 and will be replaced by a computer based interlocking remotely controlled from Centrol.
* In April 2013, Regional Rail Link works in the Spion Kop - South Kensington area will result in a new junction and the commissioning of the new passenger lines from Platforms 15 & 16 at Spencer Street Railway Station to South Kensington.

The proposed arrangements at South Kensington were discussed.

David Stosser asked what the headways on the South Morang Line are. The answer given was 3 minute headways.

Andrew McLean asked why the platforms at South Morang were 174 metres in length.

Syllabus Item: - The President introduced Members Brett Cleak and Chris Gordon.

In front of a bumper crowd (standing room only!), Brett and Chris addressed the meeting on the subject of Computer Based Interlockings.

Brett and Chris spoke for nearly 100 minutes on the subject, describing the wide variety of computer based interlockings used in Victoria from a variety of suppliers and provided examples of the various applications that computer based interlockings are used in from level crossings to crossing loops to very large track layouts.

The presentation was accompanied by a variety of images showing various computer based interlockings being used for different purposes at different locations around Victoria.

In addition, an actual processor cubicle for a computer based interlocking was available for inspection.

An excellent presentation was thoroughly enjoyed by those present.

At the completion of the Syllabus Item, The President thanked Brett and Chris for the entertainment & this was followed by acclamation from those present.

Meeting closed at 22:59 hours.

The next meeting will be on Friday 20 July, 2012 at the Surrey Hills Neighbourhood Centre, Bedford Avenue, Surrey Hill, commencing at 20:00 hours (8.00pm).

SIGNALLING ALTERATIONS

The following alterations were published in WN 16/12 to WN 25/12 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 alteration.

04.04.2012 **Cranbourne** (SWP 8/12, WN 22)

On Wednesday, 4.4., Caulfield Group Operating Procedure 16f was reissued. The change involves the provision of motorised stabling gates for the Cranbourne Stabling Sidings interlocked with the signalling system. Facilities to manually operate the gates are provided and a 'Brake Power Release' indication is provided on the 5P keyswitch.

18.04.2012 **Seymour - Echuca, Tocumwal & Dookie** (SW 55/12 & 56/12, WN 16)

On Wednesday, 18.4., Master Keys 54 & 55 for use on the Seymour - Tocumwal, Toolamba - Echuca, and Shepparton - Dookie lines were withdrawn.

It will only be necessary to issue a Master Key to a train when it is known that the train will shunt at Mooroopna, Congupna, Wunghnu, Numurkah, or Katunga. Operating Procedure 131 was re-issued and SW 44/12 is cancelled.

19.04.2012 **Dimboola - Yaapeet** (TON 81/12, WN 16)

On Thursday, 19.4., the line between Dimboola - Yaapeet was booked out of service due to infrastructure works.

19.04.2012 **Kerang** (SW 59/12, WN 16)

On Thursday, 19.4., Kerang was restored as a Train Order Crossing station. The main line points have been restored to service, as have Dwarfs N and Q. Kerang is an Intermediate Train Order Station when unattended and an Attended Train Order Crossing Station when attended. SW 32/12 is cancelled.

20.04.2012 **Murtoa - Hopetoun** (SW 57/12, WN 16)

Between Thursday, 19.4., and Friday, 21.4., the signage between Murtoa and Hopetoun was replaced. The 'Commence' and 'End' Train Order boards adjacent to Home 298/22 at Murtoa and at 408.950 km at Hopetoun were replaced. The existing location boards at Murtoa (Hopetoun line), Warracknabeal, and Hopetoun were replaced by new location boards consisting of a reflectorised yellow triangle with the location name in black text. Location Clearance signs were provided on the rear of the Location Boards. The new boards are located 2,500 metres from the Home signal or the 'End Train Order Working' board.

20.04.2012 **Dimboola** (SW 57/12, WN 16)

Between Thursday, 19.4., and Friday, 20.4., the signage at Dimboola on theYaapeet line was replaced. The 'Commence' and 'End' Train Order boards adjacent to Home 362/32 at Dimboola were replaced. The Yaapeet line location board were replaced by new location boards consisting of a reflectorised yellow triangle with the location name in black text located 2,500 metres from the Home signal. Location Clearance signs were provided on the rear of the Location Boards.

22.04.2012 **West Tower** (SW 46/12, 51/12, 58/12 & 139/12, WN 14, 15, & 16)

On Sunday, 22.4., the North Hump Avoiding Track was abolished between Points 117 on the Down Main Goods and Points 129 on the South Hump Avoiding Track. Points 117U were secured normal and Points 129 reverse. Points 117D and 125 were abolished. Amend Diagram 1/12 (West Tower).

22.04.2012 **Diamond Creek** (SWP 9/12, WN 16)

Commencing on Sunday, 22.4., the instructions in SW 509/01 were replaced by a new Clifton Hill Group Operating Procedure 10 (Diamond Creek - Procedure for crossing a Down train with the first Up train).

When it is necessary for the first Up train to cross a Down train at Diamond Creek, the Signaller must collect the Diamond Creek - Hurstbridge Train Staff from Eltham (leaving the Eltham - Diamond Creek Staff at Eltham). The Signaller must then travel to Diamond Creek by road where he will switch in the panel and restore all the signals to stop. The Signaller must then take the Diamond Creek - Hurstbridge Train Staff to Hurstbridge for the first Up and return to carry out the signalling.

22.04.2012 **Hurstbridge** (SWP 11/12, WN 16)

Commencing Sunday, 22.4., Clifton Hill Group Operating Procedure 9 (Hurstbridge - Driver in Charge of Signalling) was re-issued was re-issued (replacing SWP 1/10) to take into account the altered timetable.

22.04.2012 **Mordialloc** (SW 152/12, WN 16)

On Sunday, 22.4., automatic pedestrian gates replaced the pedestrian boom barriers at McDonald St (27.583 km) and Bear St (27.802 km). Amend Diagram 25/11 (Cheltenham - Chelsea).

23.04.2012 **Panmure** (SW 53/12, WN 16)

On Monday, 23.4., boom barriers were commissioned at the passive level crossing at Heath Marsh Road (241.765 km). The boom barriers are operated by a level crossing predictor. Trains travelling at more than 50 km/h at the predictor boards can accelerate prior to entering the crossing. Remote monitoring equipment was provided. Amend Diagram 18/12 (Panmure - Sherwood Park).

23.04.2012 **Warrnambool** (SW 52/12, WN 16)

On Monday, 23.4., boom barriers were commissioned at the passive level crossing at Tip Crossing (265.506 km) on the Up side of Warrnambool. The boom barriers are operated by a level crossing predictor. Trains travelling at more than 50 km/h at the predictor boards can accelerate prior to entering the crossing. Remote monitoring equipment was provided. Amend Diagram 28/11 (Warrnambool - Dennington).

23.04.2012 **Litchfield** (TON 82/12, WN 16)

On Monday, 23.4., the siding was booked back into service. TON 685/10 is cancelled.

(24.04.2012) **Operation of Sprinters** (TON 80/12, WN 16)

Sprinters must not operate as single cars on the following sections: Werribee - Marshall, North Geelong - Ballarat, Sunshine - Ararat & Maryborough, Sunbury - Eaglehawk & Echuca, Craigieburn - Seymour, & Pakenham - Sale. Single unit operation within station limits and local yard moves is permitted.

(24.04.2012) **Shepparton** (SW 54/12, WN 16 & WN 17)

Operating Procedure 110 (Shepparton) was reissued and SW 44/12 is cancelled. The alterations consist of instructions re the auto-normalisation of Points 7 and 29; the locking out of No 2 Road when a train is being examined in No 1 Road; and the provision of point clips.

26.04.2012 **South Geelong** (TON 83/12 & 95/12, WN 16 & 18)

From Thursday, 26.4., South Geelong will only be switched in Monday - Fridays 0345 hours - 2330 hours as a trial.

27.04.2012 **Dimboola - Rainbow** (SW 63/12, TON 90/12 & 91/12, WN 16 & 17)

On Friday, 27.4., the line between Dimboola - Rainbow (431.000 km) was restored to service. The line between Rainbow - Yaapeet remains booked out of service.

The Train Order Section Dimboola - Yaapeet was replaced by the section Dimboola - Rainbow. Dimboola is an Attended Crossing Station/Unattended Crossing Loop and Rainbow is an Unattended Train Order Terminal Station. Return Train Orders may be issued between Dimboola and Rainbow. As

Dimboola is worked by ARTC, the Train Controller at Centrol must inform the ARTC Train Controller when a Train Order has been issued to a train at Dimboola. Master Keys will only be issued to trains at Dimboola if they need to shunt at Antwerp.

The Up and Down main line points at Arkona, Tarranyurk, Ellam, and Pullut have been removed and the track straight railed. In each case the siding itself remains intact.

At Antwerp the Up and Down end points are secured by Master Key locks. Hand operated derails, secured by V5PSW locks, are provided at each end of each siding.

At Jeparit, Nos 2 and 3 Tracks were returned to use, together with a crossover facing Down trains between these two tracks at the middle of the yard, and a dead end extension of No 3 Track at the Down end of the yard. The Master Key locks were removed from the main line points. The main line points, the crossover points, and the points leading to the dead end are secured by hand locking bars and padlocks. A hand operated derail is provided at the Up end of No 3 Track and at both ends of No 2 Track.

At Rainbow, the loop siding was returned to use. The main line points are secured by hand locking bars and padlocks. Hand operated Derails are provided at both ends of the loop. Vehicles cannot be stabled on the main line. A Down Location Board was provided at 424.000 km. 'End' and 'Commence' Train Order Working Boards were provided at 425.500 km. The Up end points are at approximately 427 km. Baulks are provided at 431.000 km.

The Location Board and Train Order Working Boards were abolished at Yaapeet.

SW 61/12 & 62/12 and TON 81/12 are cancelled.

29.04.2012 **Pakenham - Traralgon** (SW 69/12, WN 17)

Commencing 0600 hours, Sunday, 29.4., the Train Controller, Centrol, for the section Pakenham - Bairnsdale will also act as the Signaller for the Pakenham - Traralgon section.

29.04.2012 **Centrol** (SW 69/12, TON 86/12, WN 17)

From 0600 hours on Sunday, 29.4., the room allocations at Centrol are now:

* Room 4: Melbourne - Bairnsdale & Lyndhurst (open continuously)
* Room 5: Melbourne - Warrnambool, Murtoa - Hopetoun, Dimboola - Rainbow (open continuously)
* Room 7: North Geelong - Yelta & branches, Melbourne - Ararat (closed 0140 - 0530 Sundays)
* Room 8: Melbourne - Bendigo - Inglewood, Piangil, Moulamein, & Deniliquin (open continuously)
* Room 10: Sunshine - Brooklyn - Newport (West Line), Melbourne - Tocumwal, Echuca, & Dookie (open continuously)

Rooms 1, 6, & 9 are future Train Control Rooms

(01.05.2012) **Camperdown - Dennington** (SW 64/12, WN 17)

Diagrams 36/12 (Panmure - Sherwood Park) and 26/12 (Warrnambool - Dennington) replaced 18/12 and 28/11 as in service.

(01.05.2012) **Batesford - Gheringhap Loop** (SW 65/12, WN 17)

A return Train Order may be issued for the section Batesford - Gheringhap Loop when it is necessary to shunt the Gheringhap Gypsum Siding.

(01.05.2012) **Frankston - Stony Point** (SW 165/12, WN 17)

Diagram 57/11 (Leawarra - Stony Point) replaced 103/10. The new diagram shows the Peninsula Freeway underline bridge.

05.05.2012 **Frankston** (SW 166/12, WN 18)

On Saturday, 5.5., the disc signals on Posts 8 (lever 50), 9 (lever 49), and 11 (lever 43) were converted to LED two position dwarf signals. Diagram 41/12 (Bonbeach - Frankston) replaced 7/11.

10.05.2012 **Henty Block Post** (SW 76/12, WN 18)

On Thursday, 10.5., Henty Block Post was established at 359.900 km in the Warracknabeal - Hopetoun Train Order section. Location boards, with clearance signs on the rear, were provided 2,500 m from the block point. Operating Procedure 131 was reissued and SW 73/12 was cancelled.

10.05.2012 **North Bendigo - Eaglehawk** (SW 70/12, WN 18)

On Thursday, 10.5., boom barriers were provided at the flashing lights at Holdsworth Rd (167.477 km). Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment is provided.

Predictor boards were also provided at Prouses Rd (166.660 km) and Nelson St (168.399 km). Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing.

Diagram 38/12 (North Bendigo Junction) replaced 186/11.

11.05.2012 **Ballarat East** (SW 82/12, TON 105/12, WN 19)

On Friday, 11.5., the Turntable Road was booked into service.

Operating Procedure 73 (Ballarat East Locomotive Depot) was reissued on 10.5. to add procedures for access to the turntable and Steamrail sidings. SW 64/10 was cancelled.

The points to the Turntable Road lead from No 9 Road and are secured away from the turntable by a hand locking bar and independent padlock. Two sets of hand operated gates are provided in the turntable lead for the security fencing, and a chain link fence around the turntable with removable sections over the access track. Prior to accessing the turntable, the loco crew must obtain permission

from the Signaller Ballarat, who must, in turn, check with the fuel point driver that the movement can occur without delaying movements in the loco depot. Once permission is granted the loco crew must obtain the keys to the Turntable Road from the Signaller.

13.05.2012 **ARTC Code of Practice Section 17, CTC** (TN 823/12, WN 16)

Commencing at 0001 hours on Sunday, 13.5., Section 17 (CTC) Rule 7 (Failure of signals) was amended to allow the Train Controller to authorise the Driver to pass a Home Arrival or Home Departure signal at Stop before the points in advance had been placed in the hand operating position. Should the Driver consider that difficulty would be encountered in stopping the train before the points, alternative arrangements can be made.

15.05.2012 **Ballarat East** (TON 108/12, WN 20)

On Tuesday, 15.5., the Turntable Road was booked out of use due to the condition of the turntable.

16.05.2012 **Sale** (SW 78/12, WN 19)

On Wednesday, 16.5., boom barriers were provided at the flashing lights at Sale - Cowarr Rd (197.454 km) on the Up side of Sale. Operation of the level crossing is by predictors. Remote monitoring equipment was already provided.

17.05.2012 **Rosedale** (SW 79/12, WN 19)

On Thursday, 17.5., boom barriers were provided at the flashing lights at Willung Rd (180.523 km) on the Down side of Rosedale. Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment was already provided, but yellow whistle boards and healthy state indicators will be provided.

12.05.2012 **Bendigo** (SW 81/12, WN 19)

On Saturday, 12.5., Homes BDG32, BDG34, and BDG36 were upgraded to LED heads.

18.05.2012 **Rosedale** (SW 80/12 & 84/12, WN 19)

On Friday, 18.5., boom barriers were provided at the flashing lights at Longford Rd (184.298 km) on the Down side of Rosedale. Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment was already provided, but yellow whistle boards and healthy state indicators will be provided.

Diagram 40/12 (Rosedale - Sale) will replace 16/12.

21.05.2012 **Warrnambool** (SW 86/12, WN 20)

Commencing Monday, 21.5., Operating Procedure 65 (Warrnambool) was reissued to allow for a signaller to be on duty when required. SW 70/10 was cancelled.

Normally, Warrnambool is worked under Driver-in-charge conditions, however, the Train Controller may arrange for a Signaller to be in attendance to facilitate train running. When commencing duty the Signaller is to contact the Train Controller to find out the arrival times of any expected trains. The Signaller is to talk to the Driver of any passenger train to find out if the train preparation has been completed, obtain the Annett key, and inform the Driver that a Signaller is on duty. When the Signaller is on duty they are responsible for the operation of all signals and main line points. The Annett key and Train Register Book is to be held in the booking office while a Signaller is on duty. Before ceasing duty, the Signaller is to obtain the permission of the Train Controller. The Down Home is to be secured at clear if there is no train at the platform.

21.05.2012 **Maryborough** (SW 85/12, WN 20)

Commencing Monday, 21.5., Operating Procedure 80 (Maryborough) was reissued due to altered procedures for stabling trains in Nos 2 and 3 Roads. SW 142/10 is cancelled.

Rollout protection is provided in No 2 Road and trains are permitted to be stabled in No 2 Road. To permit through movements, the Signaller is to ensure that either No 2 or No 3 Roads are clear at the end of shunting operations.

(29.05.2012) **Malmsbury - Elphinstone** (SW 90/12, WN 21)

Diagram 28/12 (Malmsbury - Elphinstone) replaced 38/11 as in service.

29.05.2012 **Sherwood Park** (SW 87/12, WN 21)

On Tuesday, 29.5., boom barriers were provided at the flashing lights at Aitkens Drive (261.297 km). Operation of the two position automatic signal remains unchanged. Operation of the level crossing continues to be by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. The original predictor boards were abolished.

29.05.2012 **Bell - Keon Park - Epping - South Morang** (SWP 12/12, WN 22)

On Tuesday, 29.5., Clifton Hill Group Operating Procedure 1 (Bell - Keon Park - Epping - South Morang - Failure of Signals) was issued. The main change is the restoration of recorders for the signal post telephones at Keon Park, Thomastown, Lalor and Epping, and their provision at South Morang. Calls from the post telephones at Bell are not recorded..

30.05.2012 **Sherwood Park** (SW 88/12 & 89/12, WN 21)

On Wednesday, 30.5., boom barriers were provided at the flashing lights at Mahoneys Rd (261.961 km). The notice board applying to Down trains at Sherwood Park remains unchanged. Operation of the level crossing continues to be by predictors. Trains travelling at more than 50 km/h at the predic-

tor boards may accelerate before reaching the crossing. The original predictor boards were abolished.

Diagram 42/12 (Panmure - Sherwood Park) replaced 36/12.

30.05.2012 **Hurstbridge** (SWP 16/12, WN 22)

On Wednesday, 30.5., Clifton Hill Group Operating Procedure 11 (Hurstbridge - Failure of Home Signal) was issued.

01.06.2012 **Ballarat** (TON 113/12, WN 22)

On Friday, 1.6., Ballarat Yard was booked out of service due to track condition. The hand points leading from the Independent Track towards Ballarat Yard have been spiked normal, and a baulk has been provided in No 5 Siding opposite Post 36.

(05.06.2012) **Moonee Ponds Creek - South Dynon** (SW 92/12, WN 22)

Diagrams 3/11 (Moonee Ponds Creek) and 5/11 (South Dynon) replaced 95/10 and 3/10 respectively.

05.06.2012 **West Vic Siding** (TON 114/12, WN 22)

On Tuesday, 5.6., West Vic Siding (Warrnambool) will be booked out of service due to infrastructure works. The line has been baulked at 267.650 km on the Down side of Wellington Road.

05.06.2012 **Rochester - Echuca** (SW 91/12, WN 22)

On Tuesday, 5.6., boom barriers were provided at the passive crossing at Anderson Rd (239.483 km). Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment was provided, and yellow approach section boards will be provided. Amend Diagram 96/11 (Rochester - Echuca).

06.06.2012 **Diverging speed through points** (SW 201/12, WN 22)

'25 km/h diverge speed' boards will be erected in the Metro Trains Network where the diverging speed through the points is 25 km/h. Amend Page A59 of the Metropolitan WTT System Description.

From 0400 hours on Wednesday, 6.6., these 25 km/h speed boards were erected at Viaduct Junction (turnouts from Caulfield Loop Viaduct to Platform 14, Northern Loop Viaduct to Platforms 12 or 14, and Platforms 12 or 13 to the Northern Loop Viaduct) and Frankston (turnout from No 3 Track to Up Line).

06.06.2012 **Boorcan** (SW 93/12, WN 22)

On Wednesday, 6.6., boom barriers were provided at the flashing lights at Boorcan Rd (211.227 km). Operation of the level crossing continues to be by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Yellow approach section boards and healthy state indicators will be provided.

Diagram 48/12 (Camperdown - Terang) replaced 101/11.

07.06.2012 **Geelong** (SW 99/12, WN 23)

On Thursday, 7.6., the warning bells and lights for No 9 Road were temporarily taken out of use. Operating Procedures 61 (South Geelong - Geelong) and 63 (Geelong Passenger Yard) will continue to apply.

07.06.2012 **Camperdown** (SW 94/12, WN 22)

On Thursday, 7.6., boom barriers were provided at the flashing lights at Cobden - Stoneyford Rd (178.262 km). Operation of the level crossing continues to be by predictors and remote monitoring has already been provided. Yellow approach section boards and healthy state indicators will be provided. Amend Diagram 12/11 (Birregurra - Colac)

08.06.2012 **North Short - Midway Siding** (TON 122/12, WN 23)

On Friday, 8.6., Midway Siding was booked out of use account track condition. The points to the siding have been secured for the North Shore Arrival Lead.

11.06.2012 **Sunshine** (SW 194/12 & 95/12, WN 22)

Between Saturday, 9.6., and Monday, 11.6., the section of Siding B between 12.896 km and Anderson St was taken out of use. Baulks were provided at the Down end of the loop and main siding at 12.896 km and the hand points at the Down end of the loop in Siding B were abolished. The now dead end Sidings B are only available for stabling track machines for V/Line. The points are secured by a point clip and the Signaller must maintain a block on the points. Amend Diagram 47/10 (Sunshine).

(12.06.2012) **Book of Rules - Section 18 (Train Order System)** (SW 98/12 WN 23)

The following means may be used to determine if a train has arrived complete at an Attended Crossing Station or Train Order Terminal Station (Section 18, Rule 26): 1) Roll-by inspection, 2) By a Signaller observing the train is complete (this includes by CCTV), or 3) by TAILS, ETAS, or Digitair air brake monitoring systems.

(12.06.2012) **Signalling Locations** (TON 120/12)

The operating hours of signal boxes in the Network Operating Requirements has been updated. Locations that have changed are: Latrobe Regional Signal Control, North Geelong 'C', South Geelong, Camperdown, Maryborough, Echuca, Wallan, Kilmore East, Broadford, Seymour and Shepparton. Murtoa and Dimboola are to be deleted.

(12.06.2012) **Upfield** (SW 205/12, WN 23)

The blocking jack function on the panel was temporarily removed to assist signal maintenance fault finding. If a Departure Home fails the Signaller must sleeve the appropriate lever normal before issuing a System Caution Order.

14.06.2012 **Rosedale - Sale** (SW 97/12, WN 22)

On Thursday, 14.6., boom barriers were provided at the passive crossing at Velore Road (194.105 km). Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment was provided. Amend Diagram 40/12 (Rosedale - Sale).

18.06.2012 **Colac - Camperdown** (SW 100/12, WN 22)

On Monday, 18.6., boom barriers were provided at the flashing lights at Swan Marsh Rd (169.088 km). (Note the distance in the Network Operating Requirements was previously shown as 169.082). Operation of the level crossing continues to be by predictors and remote monitoring has already been provided. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Yellow whistle boards were provided. Amend Diagram 12/11 (Birregurra - Colac)

(19.06.2012) **Metrol** (SW 208/12, WN 23)

The area of control of the panels at Metrol are as follows:

Clifton Hill Panel. Flinders Street platforms 1, 1A, & 14; City Circle Loop Viaduct, Southern Cross No 9 track, (and No 8 Centre, No 8 South, and 8A, but only for moves departing towards Flinders St); and City Circle Underground Loop. (This should also list Clifton Hill line Flinders St to Clifton Hill.)

Burnley Panel. Flinders Street platforms 2, 3, & 4 (Down trains towards Richmond only); Burnley Loop Viaduct, Southern Cross No 10 Track; Burnley Underground Loop; Burnley Local and Through Lines between Flinders St & East Richmond.

Northern Panel. Flinders Street platforms 4 & 5; Northern Loop and Northern Viaduct; East Suburban and Main Suburban lines Southern Cross to North Melbourne; North Melbourne Platforms 1 & 3; Southern Cross: 10A and Platform 11, Platform 7 North, Platforms 8 North, Centre and South & 8A (for local movements and departures towards North Melbourne and the Carriage Sidings.

Caulfield Panel: Flinders Street platforms 6, 7, 8, 9, 9A, 10, 12, & 13; Caulfield Viaduct, Southern Cross Platform 12; Caulfield Underground Loop; Caulfield Local, Caulfield Through, Special, & Sandringham lines Flinders St - Richmond; Through Suburban lines Southern Cross - North Melbourne; North Melbourne platform 5; Main Goods Line Southern Cross - West Tower.

Western Panel: North Melbourne Platforms 2, 4, & 6; Lines from North Melbourne to Macaulay, Kensington, & South Kensington; Goods Lines at South Kensington.

(19.06.2012) **Lynbrook Loop - Cranbourne** (SW 210/12, WN 23)

Diagram 69/12 (Lynbrook Loop - Cranbourne) replaced 55/11 as in service.

19.06.2012 **Marshall - Winchelsea** (SW 101/12, WN 22)

On Monday, 19.6., boom barriers were provided at the flashing lights at Cape Otway Rd (96.376 km - note previously shown as 96.554 km). Operation of the level crossing continues to be by predictors and remote monitoring has already been provided. Yellow whistle boards were provided. Amend Diagram 48/11 (Waurn Ponds - Winchelsea)

(26.06.2012) **Waurn Ponds - Colac** (SW 107/12, WN 25)

Diagrams 58/12 (Waurn Ponds - Winchelsea) and 4/12 (Birregurra - Colac) replaced 12/11 and 48/11 respectively.

26.06.2012 **Rosedale - Sale** (SW 102/12, WN 22)

On Tuesday, 26.6., boom barriers were provided at the passive crossing at Wrights Lane (175.254 km). Operation of the level crossing is by predictors. Trains travelling at more than 50 km/h at the predictor boards may accelerate before reaching the crossing. Remote monitoring equipment was provided. Amend Diagram 16/12 (Rosedale - Sale).

27.06.2012 **Stratford** (SW 105/12, WN 25)

On Wednesday, 27.6., boom barriers were provided at the flashing lights at Princes Hwy (222.535 km). Operation of the level crossing continues to be by predictors. RFR predictor boards & healthy state indicators were provided. RFR predictor boards were also provided at McAlister St (221.839 km). The Down predictor board for McAlister St is only located 187m from the crossing due to clearance issues on the Stratford River bridge. The Down predictor board for the Princes Hwy is located 400m from the crossing and on the wrong side of the line due to Stratford platform. Trains travelling at more than 50 km/h at the predictor boards of both level crossings may accelerate before reaching the crossing. Amend Diagram 98/11 (Stratford)

01.07.2012 **Drouin - Warragul** (SW 106/12, WN 25)

On Sunday, 1.7., boom barriers were provided at the flashing lights on the North Line at Lardners Track (95.625 km). Remote monitoring equipment had already been provided.

Diagram 24/12 (Warragul - Yarragon) replaced 108/11.

The Mystery GRS Power Frame

Bob Taaffe

GRS supplied a number of power frames to SAR, VR and NSWR in the World War One period. SAR came first and commissioned two (Adelaide Station and Adelaide Wye), VR followed with South Yarra in 1915 which was a hybrid type (pistol grip levers for signals and locks and normal mechanical levers for the points) and then the final two by NSWR (Flemington Goods Jct – 1916 and Meeks Road Junctions – 1918). These machines were of the GRS Model 2 type. Later VR types were model 2B or 4 (e.g. Brighton Beach) and were made by MV-GRS.

A recently found NSWR S&T Branch file raised some interesting issues. These concern Meeks Road Junction and the project to build 6 tracks between Erskineville and Tempe in the late 1940s.

Meeks Road Junction signal box contained a 80 lever GRS Model 2 frame, but as it was different in arrangement to that shown in the GRS catalog it is believed to have been a Model 2A. Signal Engineers who worked on both the NSWR frames said they were different in construction.

When the frame was dismantled a good many years ago (purchased for $500) there were 104 levers in the frame. The additional 24 had no handles fitted and many of the bits were different from the original section. As time was of the essence in the dismantling, and the significance not known at the time, no time was available to do an investigation.

Construction of the frame consisted of a long cast iron open box (or bed) that sat on low frame legs. The box was open at the top. The tappet locking trays were bolted to both the front of the legs and the box. On top of the box the lever units were bolted with the locks being slung underneath the lever in the open box. There was a cam slot in the lever slide that worked a vertical tappet via a roller. Rotary contacts were attached to the rear of the lever slide. The diagram of the Model 2 (attached) will provide the rest of the information.

The file concerns various signalling issues relating to the sextuplication project but for us it commences with a memo from the S&T Engineer dated 7 Nov 1947. The memo says "The extension of the interlocking machine is to be taken in hand. For this purpose, the parts necessary from the machine purchased from Victoria are to be equipped at Redfern as a unit, and Mr Neale is to report as to what shortages exist after the materials have been checked".

The next memo is from the Engineer for Power Signalling dated 10 Nov 1947 and titled "Meeks Road – Extension of Interlocking Machine" and says "Will you please arrange to have a 10 lever section of the GRS type interlocking machine, now in the Wire Store at Sydney Yard, taken to the Fitters' Depot at Redfern for the purpose of being equipped to suit the proposed extension to the Meeks Road machine".

This was followed by a memo from the Chief Designing Engineer in the Drawing Office on 19 Dec 1947 to Mr Neale. This memo detailed the work required (now 24 levers) –

> In connection with the provision of an additional unit, consisting of 24 levers, at Meeks Road Signal Box, it is recommended that the work be carried out as follows:
>
> 1. Existing 40 lever unit to be stripped of lever guides, locking boxes and brackets. This

(Below) An official photograph of Meeks Road, probably shortly after commissioning.

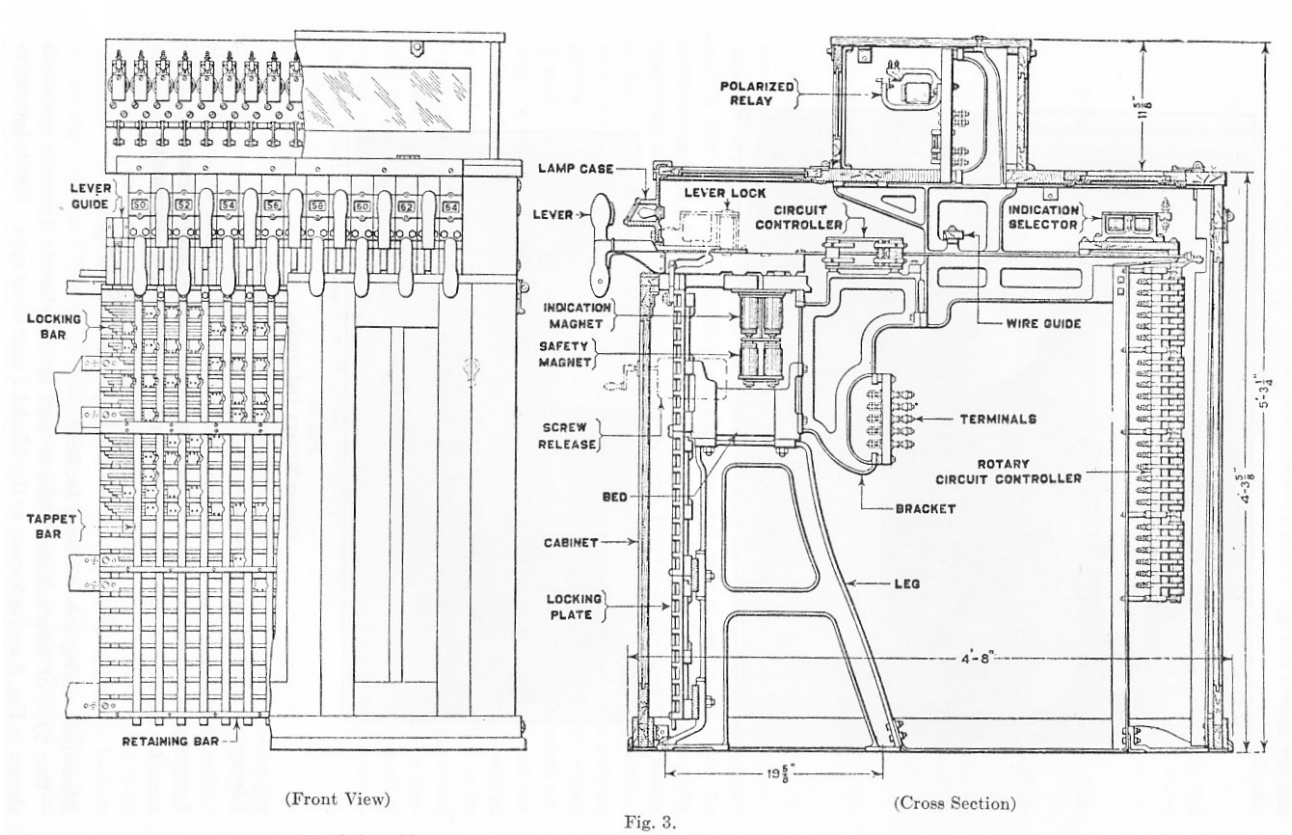


Fig. 3.
Model 2 Unit Lever Type Machine Equipped with Rotary Circuit Controllers.

A drawing of the final development of the GRS Model-2 Unit Lever frame (above), which can be compared with the partially re-assembled levers 1 - 40 of the Meeks Road frame (below). The main difference between the earlier Model-2 frame (shown on the opposite page) is the provision of the bank of rotary circuit controllers at the rear of the frame. This has caused the polarised relay and terminal board to be relocated to a box above the frame. Drawing from 'American Railway Signaling Principles and Practices, Chapter 19, Electric Interlocking', 1950. Photo by Bob Taaffe.

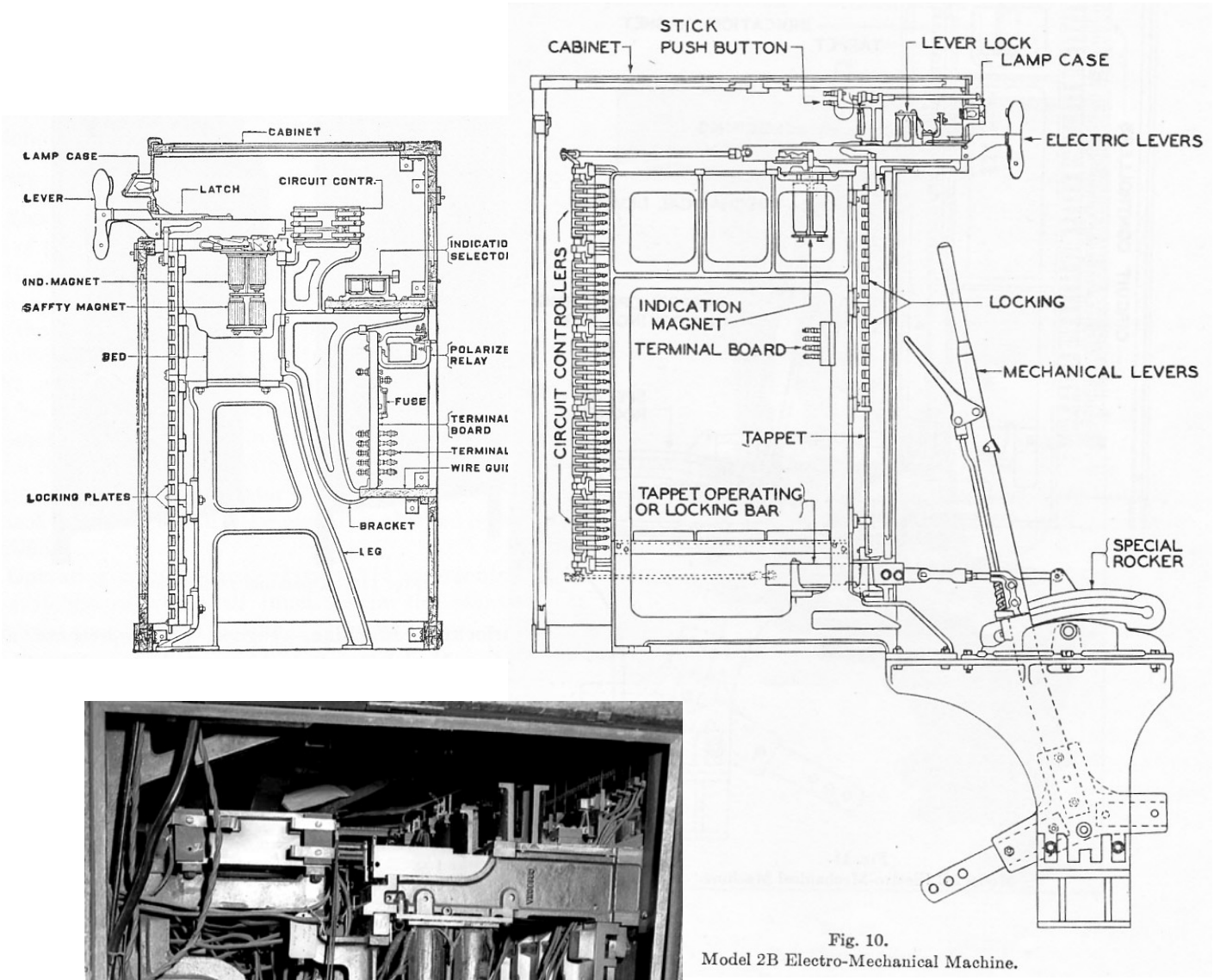
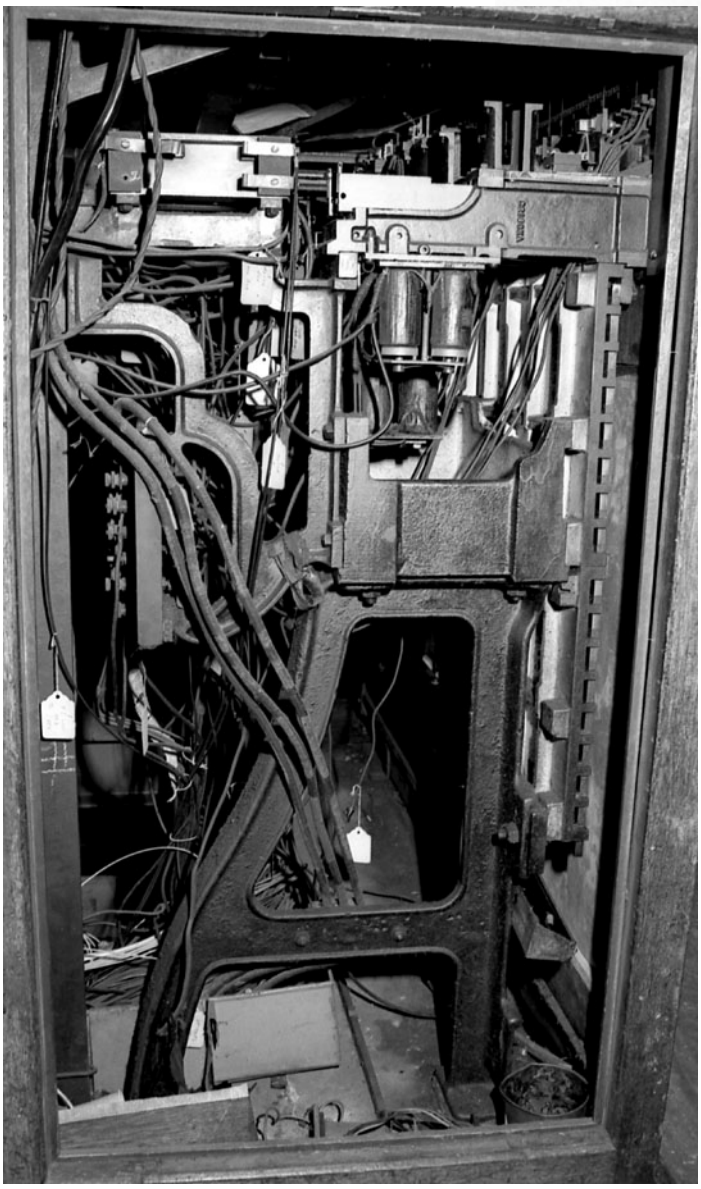


Fig. 10.
Model 2B Electro-Mechanical Machine.



(Above left). The original GRS Model 2 unit lever frame which can be compared with the later style as at Meeks Road. The mechanical interlocking is arranged across the front of the machine, with the lever locks behind and underneath the lever. Behind the lever are the two massive circuit controllers - these frames were designed with the intention that the full current to operate the point motors would pass through these contacts. At the back of the frame are terminal board and relays used for the dynamic indication system. This was probably the style of frame supplied for South Yarra. Drawing from 'Railway Signaling' by E.E. King, 1921. (Left) A photo inside the case at Meeks Road before it was dismantled from the No 1 lever end. The various parts can be indentified from the drawings reproduced on these pages. The rats nest of wires is to be noted! Photo: Bob Taaffe. (Above) The GRS Model 2B frame was a considerable redesign from the Model 2. This style of frame was designed to be used with mechanical operation of the points - note the large circuit controller is missing, as are the relays and other equipment for the dynamic indication system. A bank of rotary circuit controllers is provided at the rear of the frame, just as in the later Model 2 frames. This style of frame was almost certainly used in Victoria at Hawthorn and Camberwell, although the interlocking between the electric and mechanical frames was by means of a sword connected to the mechanical lever below the floor. Drawing from 'American Railway Signaling Principles and Practices, Chapter 17, Mechanical and Electro-Mechanical Interlocking', 1933.

work to be done in the Wire Store.

2. Remaining portion, consisting of legs, bed and 3"x ¾" M.S. bars, to be forwarded to Signal Workshops, Chullora.
3. (a) C.I. bed to be cut and drilled
   (b) One leg to be re-positioned
   (c) 3" x ¾" M.S. bars to be cut and drilled to suit new leg centres
   (d) 2 full and 2 half brackets to be fabricated, fitted and checked for alignment
   (e) Timber foundation and supporting bracket to be made up.
   This work to be done in Signal Workshops in accordance with Dwg C.05084 (attached).
4. New 24 lever unit to be forwarded to Meeks Road Signal Box.
5. All necessary equipment, levers, guides, locking boxes, circuit controllers, etc., to be forwarded from Wire Store to Meeks Road Signal Box.
6. Mechanical locking and electrical apparatus to be installed.
7. Existing cabinet to be extended.
8. Machine to be wired in accordance with wiring diagram.

Mr Neale to issue requisition covering work in Signal Workshops.

The forwarding of material and the carrying out of all work, except as in para 3, to be Mr Daley's responsibility.

Then we have a memo from Engineer for Power Signalling to Mr Daley on 23 Dec 1947. This is essentially a repeat of the above memo but now calls it the Model 2 GRS Frame. It notes that the work of fitting the mechanical locking and various electrical equipment to be carried out by the Interlocking Fitters on the District.

The next memo is from Engineer for Power Signalling to Mr Neale dated 5 Jan1948. The memo states that the equipment stripped from the machine is to be stored carefully at Redfern until required for the extension at Meeks Road or for any other purpose. It also noted that the lock coils and such equipment might require reconditioning. Finally, it stated that as it was probable that the dynamic feature would not be required for the extension, and in this case the lock coils might require re-winding.

On the following day the Engineer for Power Signalling issued a Requisition No and Charge Code to the Stores Manager at Chullora.

The Fitters at Cornwallis Street Depot Redfern advised Mr Daley on 9 Jan 1948 of the material placed in Cornwallis St Store from Wire Store Sydney Yard.

There are no more memos of interest on the file which seems to finish in August 1948.

As mentioned above, the extension was fitted to the machine but was never commissioned. The project was shut down when one of periodical capital expenditure squeezes took place.

A similar extension took place to the Westinghouse B machine in Sydenham Signal Box, although part of it was eventually used when the six platforms were brought into use in the early 1960s.

Now the point of all this long winded dissertation is: where in the VR did the 40 lever machine purchased from the VR, presumably about 1947, come from? The only possible frame it could be is the original power frame from South Yarra - commisssioned 3 Oct 1915 and decommissioned 15 April 1945. These dates would fit with the Meeks Road work. The only problem is that South Yarra is quoted as a 32 lever frame in the Victorian Interlocking Register.

The frame at Meeks Road on 20 April 1985 with the extension at the right hand end. The handles have not been fitted to the levers in the extension. Photo: David Langley

The Laverton Derailment
10 July 1976

In the evening of Saturday, 10 July 1976, the Up Port Fairy passenger train derailed at 70 mph on No 3 Crossover at the Up end of Laverton. The entire train was derailed, and one passenger, Patricia Cini, was killed. The following description of the accident is taken from the transcript of the Inquisition held at the Coroner's Court.

No 74, the Up Port Fairy passenger train, consisted of 6 cars: ABU36, ABE14, AW27, BE49, AS3, and CE22 and was hauled by B61. When the pass arrived in Geelong a new crew took over for the run into Melbourne. The driver was very experienced, having joined the railways in July 1947 and had been a classified driver since August 1955. At Geelong, the driver conducted training classes, and, in fact had conducted the fireman's initial course on signalling and safeworking. The fireman, on the other hand, was relatively inexperienced, having joined the railways less than 18 months previously as a trainee engineman and had been a Engineman Class 2 (Fireman) for around 9 months. The fireman was not originally intended to fire on this train. He had finished his previous shift on a pilot at around 5.20 am on the Saturday morning. He went home, had about 3 hours sleep, and then went to his parent's shop in Leopold and stayed there all day. About 4.30 pm he got a message from Geelong Loco that they required a Fireman for 'A' Pilot. He agreed to perform the duty and signed on at 6.32 pm. At about 7 pm, the driver came to the Pilot and informed the fireman that he was to replace the rostered fireman for the Up Port Fairy who was not available. When they reached the station, the driver suggested that fireman ring the Depot Foreman. The Foreman asked the fireman if he felt well enough to run the train. The fireman assured him that he was; although he had only three hours sleep that morning, he had had 12 hours the previous night.

The pass departed right time from Geelong at 7.15 pm and travelled on the West Line to the end of double track at Corio where a stop was made (scheduled 7.26 pm). From Corio through Lara to Little River was still single track. The train stopped at Lara and continued on the single line to Little River where the double track re-commenced. At Little River the train was non-stop and it was routed to the East Line (probably because this avoided slowing the train for the medium speed diverge to the West Line). The train stopped at Werribee for three minutes (scheduled arrival 7.50 pm). On departure from Werribee the train was routed to the West Line as No 105 Down Goods was approaching Werribee on the East Line. The pass then approached Laverton under clear signals on the West Line at 70 mph.

Double track at this time existed from Newport - Newport South - Altona Junction - Laverton - Werribee. Between Newport South and Werribee the lines were bi-directionally signalled and known as the East Line and West Line. Both lines were equipped with three position signalling and worked under the ATC System. Laverton was provided with two main line crossovers (one at each end) to allow moves between the two main lines. These crossovers had a speed limit of 25 mph for the diverging movement. A refuge siding (No 3 Road) and goods sidings were provided, but these are not relevant to the derailment. Laverton was provided with a relay interlocking locally controlled from a panel in the station building.

As the Up Port Fairy passenger train approached Laverton on this night, the West Line between Altona Junction and Laverton was occupied. At 7.40 pm the 2 pm Block Oil train from Wodonga had been signalled from the Goods Line at Newport B (Newport South) to the West Line to access the BP Siding at Paisley.

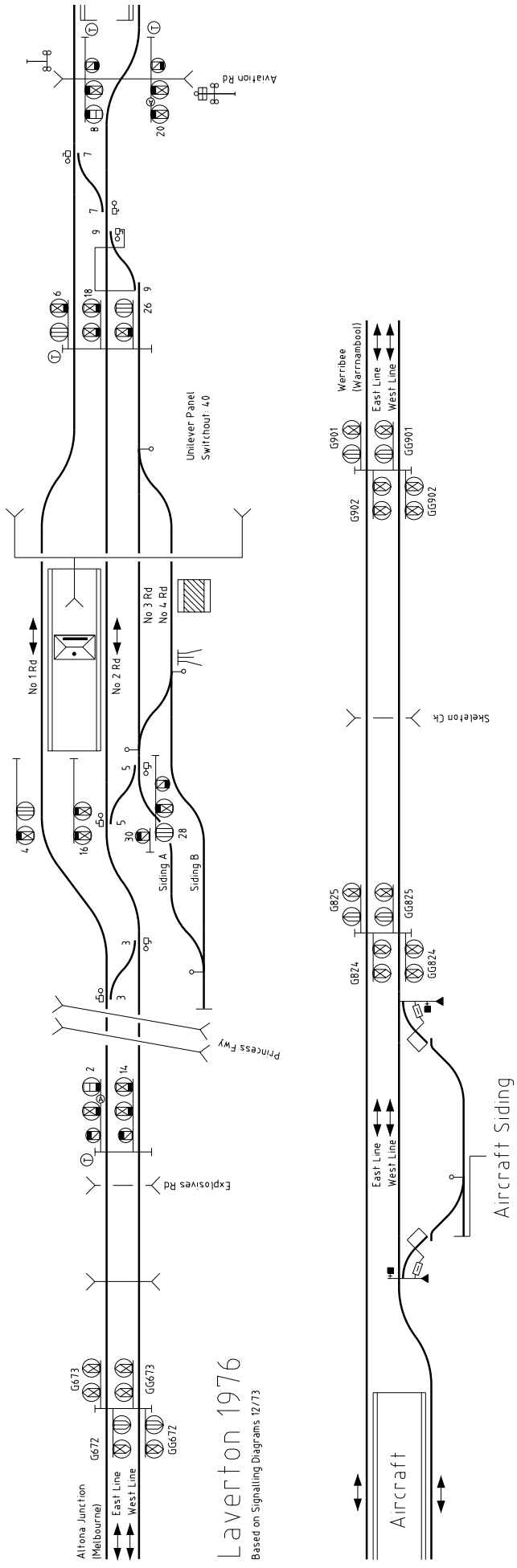
At Laverton, the relieving ASM became aware of the Block Oil between 7.40 and 7.45 when he noticed that the block light for the West Line had gone out. He contacted Newport A and learnt that the BP Pilot was on the West Line and it was shortly expected to lock away in the BP Siding. He kept an eye on the block light for the West Line to Newport, waiting for the Block Oil to lock away in the BP Siding. He was aware that the Up Port Fairy was due, and if he could signal it down the West Line he could switch the panel out. It was the end of the month and he had returns to prepare. At 7.51 pm the departure of the Up Port Fairy was belled from Werribee, and the ASM could tell that it was on the West Line as the block light went out (although it is not mentioned, he would have expected the pass to be on the West Line as the East Line to Werribee was occupied by No 105 Down Goods that had left Laverton at 7.40 pm). He then cleared Home 20 to allow the Up Port Fairy pass to enter Laverton, but he did not clear any further signals as he still hoped that it could be routed down the West Line.

After departing from Werribee Up Port Fairy had Clear Normal (green over red) aspects and the driver accelerated the train to 70 mph. It was dark at this time and the train was passing through rain squalls. As the train passed GG902 (showing Clear Normal speed) the train struck on to the Laverton panel (occupied track circuits that were repeated on the Laverton panel). The Laverton signalman then decided to speak with the Train Controller and obtain permission to route the Port Fairy passenger up the East Line.

Around 7.54 pm the Signalman in charge at Newport A noticed from his illuminated diagram that the Block Oil had cleared the West Line at the BP siding, but the block light had not illuminated. From this, he suspected that the Guard had not properly closed the door of the switch lock. The Signalman reported this to the Train Controller and they discussed the Up Port Fairy which was due on the West Line. The Train Controller stated that he would contact Laverton and instruct the Signalman there to route it up the East Line.

Irrespective of whether the Train Controller or the ASM at Laverton iniated the conversation, the Train Controller did give the ASM permission to route the Port Fairy pass onto the East Line at Laverton. The ASM then reversed Crossover 3 and cleared Up Departure Home 16. Assuming the signalling was working as designed, Home 16 then cleared to Clear Medium Speed (Red/Green), Home 20 stepped up from Medium Speed Warning (Red/Yellow) to Reduce to Medium Speed (Yellow/Green), and Automatic GG824 stepped up from Reduce to Medium Speed (Yellow/Green) to Clear Normal Speed (Green/Red). At Newport A, the Signalman noticed that Laverton had taken the block for the East Line at around 7.57 pm.

Back in the locomotive, the driver and fireman saw GG824 at Reduce to Medium Speed as they passed GG902, and shortly afterwards saw it step up to Clear Normal Speed. The driver opened the throttle from notch 1 to notch 5 or 6 to maintain 70 mph up the slight grade. The fireman stated that he thought the change in aspect on GG824 was due to a train in front, and realised that Home 20 might also be displaying a Reduce to Medium speed. However, he was "almost 100% sure that it [Home 20] was displaying a normal clear speed aspect", and he felt the same about the indication that had been displayed by



Home 16 as they approached it. Both the driver and the guard were certain that both Up Home 20 and 16 were displaying Clear Normal Speed.

As the locomotive passed the office door at Laverton at around 7.59 pm, the ASM belled the train (3 short 1 long) onto Newport. He then went to the office door as the tail of the train passed and he checked the tail light. Curiously, even though he had once been a Fireman, the ASM did not register that the train was travelling far too fast for a 25 mph (40 km/h) diverging move. Returning to the panel he noticed that the indication light for Home 16 had gone out, indicating that the front of the train had passed it, and he restored lever 16. At this time he reported the passage of the pass to Train Control. Shortly after he heard a rumbling noise and then he noticed that the track circuits on the West Line had dropped, but that those over Crossover 3 were still down. The ASM realised that something was wrong and ran out of the office to the Down end of Crossover 3. From here he could see that the points were still set for the East Line, and in the distance he could see the tail light of the train stopped on the line. He returned to the office and informed Train Control that something was wrong with the train and that it had stopped. He then returned to the Up end of the yard and met the fireman near the Geelong Road overbridge and was informed of the derailment.

The sudden diverge through Crossover 3 came as a complete surprise to the loco crew. As the locomotive swung to the right, the fireman was thrown out of his seat onto the floor. When the locomotive lurched to the left as it left the crossover, the driver landed on top of him. The force exerted by the locomotive leaving the crossover was so high that the joints in the middle of the crossover was broken and the Up end points were bodily moved sideways about 14 inches. This break in the track meant that all cars of the train were derailed. The train came to a stand on the Up side of the Princes Freeway overpass with the locomotive at the underbridge. When passing under the overpass, the locomotive was leaning so far over that the top right corner of the body came in contact with the bridge pylons. The first three cars bore the brunt of the derailment. The first car, ABU36, was badly damaged, particularly on the right hand side, and the second car, ABE14, was damaged. Either the locomotive or the two leading cars demolished the signalbridge on which was erected the Down Arrival Homes 2 and 14. The wreckage of this signal bridge completely wrecked the third car AW27. The remaining three cars, BE49, AS3, and CE22 were derailed all wheels but were not seriously damaged. Patricia Cini was in the 3rd compartment of the first carriage with her mother and father. They were returning to the parent's house at St Kilda after they had spent the day with Patricia Cini and her family in Werribee.

When the locomotive came to a stand, the fireman testified that "...I remember [the driver] saying to me, 'That was a top green wasn't it?' I said, 'I'm not sure, I think it could have been a bottom green' or words to that effect." The fireman, at this point, did not realise that the train had been diverted throught Crossover 3. Despite this testimony, the fireman was firm in his statements at the Inquisition that he was nearly 100% sure they had a Clear Normal Speed aspect on Homes 16 and 20.

After the accident the relay interlocking was thor-

oughly tested and was found to be operating as designed.

However, further investigation by the police raised two issues that clouded the results of testing the interlocking.

The first was that on the day of the accident a fault had occurred preventing Up Home 4 from clearing; this had also prevented Up Home 16 from clearing for moves to the East Line (the move that was signalled during the accident). The Electrical Fitter attended Laverton at 2 pm and found a broken wire near Galvin. A Lineman was called at 3 pm to repair the wire. The Electrical Fitter was responsible for testing the Lineman's work once it was completed. Unfortunately, the Fitter's logbook recorded that he finished duty at 4.15 pm, while the Lineman's logbook recorded that the circuit was tested "OK" at 5 pm. The Signal Engineer, in his evidence at the Inquisition, noted that the tests carried out after the accident showed that the repair work carried out in the afternoon had been correctly executed, but could not explain this discrepancy.

The second signalling issue concerned the relays in 4PCR box, situated at the Up end of the Laverton island platform. At some time the box had been damaged, probably by the tray of a truck reversing into it. Nine of the relays in the box had been damaged when they had been pushed against the mechanical latch that held them against the base plate. This had caused the base of the relays to crack, compromising the sealing of the relays and potentially cause them to stick. Tests showed that all relays were operating correctly within tolerances, and the Signal Engineer noted that the corect operation of these relays was proved in other circuits.

The Coroner also asked the VR Signal Engineer to comment on a number of alleged irregular signal aspects on the Geelong line. Some were simple blown bulbs and will not be mentioned here.

The most serious incident occurred on 8 June 1974 in which Down Automatic GG547 displayed 'Clear Normal Speed' (Green/Red) instead of 'Normal Speed Warning' (Yellow/Red) when the following signal GG673 was at Stop with a train ahead of it. This was due to a wiring error where the polarity was reversed. All the signals on the Geelong line were subsequently tested and found to be wired correctly.

A second similar problem was reported on 17 September 1974 in which G1680 was reported as displaying Clear Normal Speed, with the following signal, Home 8 at Little River, displaying Medium Speed Warning for the diverging move. Since G1680 had a fixed B light, it should have been displaying Normal Speed Warning. The fault could not be replicated.

On 14 July 1976 (i.e. after the derailment), Auto GG824 at Laverton was reported as displaying Reduce to Medium Speed with the next two signals displaying Clear Normal Speed. It was discovered that due to signal testing at Laverton there was an open circuit fault on GG824 causing it to display a more restrictive aspect than required. Two days later, GG824 was displaying Reduce to Medium Speed with the next signal, Home 20, displaying Medium Speed Warning. As a train approached Home 20 it changed to Reduce to Medium Speed, then Stop, then to Clear Normal Speed. Again this was due to testing at Laverton - in this case an intermittent fault caused by a fitter carrying out specification tests on Signal 16.

On 8 October 1976, Auto GG824 and Home 20 at Laverton were displaying Clear Normal Speed with the next signal, Home 16, displaying Stop. Similar reports were made in late September 1976, 26 October 1976, and 18 January 1977. An intermittent fault was subsequently found at Home 16 causing it to go back to danger.

The Police Chief Inspector and the Police Inspector investigating the accident both formed the belief that the accident was caused by a failure of the signalling system. They believed the loco crew when they said that they had Clear Normal Speed on both Homes 16 and 20. Neither the Chief Inspector or the Inspector could provide any theory as to how the signalling system had failed - they clearly did not understand the system that well. However, they clearly questioned the assertions they were getting from the railways that the signalling was 'failsafe'. They were concerned that they when they asked the VR Signal Engineer about faults with Homes 16 and 20 and Crossover 3 over the preceeding 12 months, he had assured them that there had been no faults reported. However, they subsequently discovered a large number of of what they considered 'faults'. It is clear that the police were not convinced by the evidence of the signal engineer or his staff.

The Coroner decided that he could not come to a conclusion about the cause of the accident. He stated "It would appear that it is not possible for the signal system to have failed to the degree that it has been claimed, but it also appears that a person of [the driver]'s reputation and background could not have misinterpreted the signals he saw". He consequently found that Patricia Cini's death was caused by misadventure. He criticised the use of 25 mph turnouts in a line with a 70 mph speed limit. He also criticised the view of the signals that could be seen from guard's seat in the van.

Despite the Coroner's finding, the most likely immediate cause of this accident was that the train crew misread Homes 16 and 20 as showing Clear Normal Speed. A possible reason for this was that seeing GG824 step up from Reduce to Medium Speed to Clear Normal Speed induced a false belief that either they were catching up with the train in front, or that the signaller at Laverton had been tardy in clearing the signals through the station. Despite his near certainity at the Inquisition, the fireman's evidence suggests that immediately after the accident he thought that they had medium speed aspects on the Homes. This is even more telling given that he had no idea why the train had derailed at the time and didn't realise that they had passed through Crossover 3 reverse. If the fireman had realised that the driver was not responding to a signalled reduction in speed, why had he not spoken up? At the time of the accident, the airline industry was realising that a major underlying cause of accidents was an 'authority gradient' which caused junior pilots to be reluctant to question the actions of senior pilots. A similar issue could be have occurred in this case as the fireman was extremely junior, while the driver was a senior driver. There is also the question of fatigue. The fireman, at least, had little sleep between shifts and it is clear that something caused either or both the Depot Foreman at Geelong and the driver to question his fitness for duty before leaving on the Geelong pass. The question of fatigue was not raised in the Inquisition, and no evidence was led as to the driver's rest prior to the shift.

If the train crew misread the two Home signals, a contributing factor could be the Victorian speed signalling system. Current UK signalling theory, accepted by other Australian railways, considers that there are three fundamental problems with the Victorian speed signalling system. The first is the use of a red light in a running proceed aspect. This is considered to desensitise train crews to passing red lights. The second is that where two lights are used to give an indication, the train crew could invert the aspect (i.e. read green/red instead of red/

green). The final problem is that the human visual system is designed to give attention to objects in the centre of the field of vision. A driver could focus his attention on one of the lights in a signal (e.g. the green) and not notice the second. However, in considering these issues in the context of the Laverton accident, the crew would have first misread Home 20 which would have been showing Reduce to Medium Speed (yellow/green). This aspect has no red light, and the inversion (green/yellow) is only a valid aspect on a repeating signal.

A failure of the signalling system cannot be completely eliminated as a cause of the accident. Although the system was tested immediately after the accident and was found to be performing as designed, this testing was not done by an independent party, and no check was carried out to test whether the design of the system was correct. There were two maintenance issues identified in the investigation. The first was the conflict in the logs of the electrical fitter and the linesman, raising the question whether the fault repair on the day of the accident was actually tested. The second was the damaged relays in 4PCR. These two issues suggest that, at least, there was a problem with the supervision of maintenance at Laverton. Without access to the circuit design, it is difficult to come to any conclusion on the signalling system or the effect of these failures. However, there is no evidence that the design of the circuits was anything other than conforming to standard failsafe practice, or that the tests were anything other than thorough. Further, the normal speed route past Home 16 was prevented from being set by two independent conditions - the West Line block being occupied, and Points 3D being reverse. This makes it slightly less likely that a single fault could cause the two Home signals to display Clear Normal Speed.

The transcript certainly highlighted the limitations of a police investigation and a coronial inquisition for determining the cause of a railway accident. It clear that the police conducting the independent investigation had no capability to judge the design and operation of the signalling system. Given this lack of capability, it is clear that the police took a 'common sense' view about the likelihood of failure of a mechanical/electrical system, and based their conclusion on who they believed - the signal engineers or the train crew. In reading the transcript it is difficult to avoid the conclusion that the signal engineers did not understand, or accept, that the police were seriously questioning the reliability of the signalling system, and that the police felt the VR was pressuring them to accept that the signalling system could not have failed. Reading the transcript was at times frustrating because obvious questions were not asked (such as: what exactly was the fault on the afternoon of the accident, and what functions did the damaged relays in 4PCR perform?) and time was spent on side issues (how the switchlock worked). A report by the contemporary UK Railway Inspectorate, or the modern ATSB, would have been far more searching.

Fog Signalling and Three Position Signals

Compared with oil lit semaphores, the electrically lit new upper quadrant signals installed in the Melbourne area were much easier to see in fog. However, the new upper quadrant signals continued to be staffed by fog signalmen during foggy weather at a considerable cost in wages and materials. This conservatism was possibly the consequence of the Richmond accident of 1911 when two Up trains collided in foggy weather. The following sketch of the efforts to withdraw fog signalmen in automatically signalled areas is drawn from the AGST's Correspondence Registers.

On 25 April 1927 the Metropolitan Superintendent recommended the withdrawal of fog signalmen from intermediate stations on lines signalled automatically where 99% of trains were electric trains (e.g. the Brighton, Clifton Hill and St Kilda lines.) except at yards and junctions. Fog signalmen would only be provided at places such as Clifton Hill A, Elsternwick, Brighton Beach, Sandringham and St Kilda. As Guards were held responsible for the protection to their trains if any unusual delay occurred and as an electric train would be tripped at two signals in the rear of a standing train before reaching it, the Metropolitan Superintendent considered the proposal quite safe. The Assistant General Superintendent of Transportation did not agree that Fog Signalmen should be withdrawn from the Brighton and Clifton Hill lines, however he did agree that Fog Signalmen could be withdrawn from South Melbourne and Middle Park stations. This was duly done.

On 26 August 1928, the Metropolitan Superintendent made another attempt to reduce fog signalling in three position signalling areas. He reported that the drivers said that fog signalling in three position signalling areas was a waste of money and a hinderance to the drivers. If the regulations could be changed, the department would make considerable savings in wages, detonators, meals and clerical labour. It was decided that a committee be formed to investigate the issue. Mr Burgess and Mr Colson (Senior Block & Signal Inspector) would represent the Transportation Branch, and either Mr Rist or Mr Balmer the Rollingstock Branch. The report of the committee was considered by the Block and Signal Inspectors conference on 10 September 1928 and unanimously endorsed. Unfortunately, the details of this report were not included in the precise. However, the Superintendent of Goods Train Services agreed with its recommendations, and on 14 September 1928 the Transportation Branch Staff Officer was asked to amend the list of Fog Signalman's posts. In 1934 it was considered that this report considerably reduced the number of fog signalman's posts.

On 7 August 1933 Commissioner Canny asked about fog signalling on suburban lines. He understood that in NSW no fog signalling was used and they depended on the light signals which could been seen for a reasonable distance through the fogs that prevail there. The S&T Engineer was asked if the lenses in the Geelong line signals were the same as those used in the suburban area, and how the suburban light signals compared with those in use in NSW. He responded that, "The signals on the Geelong line have a greater range and display a more brilliant light than the old type light signal. The lenses on light signals on the Geelong line are of the "doublet" type and are 8" in diameter. A single 5 3/8" lens is fitted to the older type of light signal in the metropolitan area. The old type is fitted on all signals from Viaduct to North Melbourne and Richmond to Canterbury. The majority of light signals on the NSW suburban lines are fitted with 8" lens and are similar to and supply the same brilliancy of light as the Geelong line signals." Commissioner Canny was duly informed in November 1933, but the AGST stated that although the 8" lenses are more brilliant, "to my mind"

this did not obviate the necessity of employing fogmen, as even with the 8" lens if might not be possible to see the signals at the required distance (not less than 400 yards). He considered that the question to be decided is "Can an 8 inch lens light signal always be seen through a fog for a distance of not less than 400 yards?" As the Victorian fogs varied in density, the AGST "respectfully suggest that it would not be advisable to exclude the locations where the 8" lens light signal is in use." Commissioner Canny responded: "Noted in the circumstances we will have to continue our fog signalling arrangements, but we might look into the matter further to see if we could cut any fogmen out by the introductionof the 8" lens at particular points on relatively unimportant sections." Mr Baynes was asked to list the locatoins where 8" lens could be used instead of fogmen and Mr Colson asked to indicate posts that are manned by fog signalmen.

In July 1934 the Metropolitan Superintendent was informed that, although the 1928 review had considerably reduced the number of fog signalmen employed, it has been suggested that the number of fogmen employed at certain locatoin is still in excess of actual requirements. A committee was formed of Mr Baynes (Safeworking Officer), Mr Colson (Senior Block & Signal Inspector), probably Mr Bell (Electrical Running Inspector) and Mr Young (Signals Division). The committee reported on 9 August 1934:

> Since the principle questions set down for consideration was whether the number of fog signalmen at present employed in the suburban area could not, with due regard to safety, be reduced, the Committeee decided at the outset to examine the existing instructions and practices with the view to determining how far the necessity which gave rise to them had been relieved by more recent developments in running conditions and in signalling apparatus. A considerable discussion ensured during which the following principle questions were raised: 1) What is the reason for the employement of fog signalmen, 2) Whether on lines wholely equipped with three position automatic signalling an on which steam trains do not normally run, fog signalmen should be employed at all. 3) Which signals should be manned at intermediate stations in three position areas where fog signalmen are now employed. (4) What principles should be followed in respect of fog signalling at gate crossings.

Unfortunately the conclusions to these questions were not recorded in the precis. However, on 22 September 1934 the Secretary was informed that the committee had recommended: 1) 133 men be withdrawn from signal posts listed [not given in precis], 2) fog signalmen at present employed at the second automatic signals in the rear of station platforms, listed in Appendix A, be moved to the automatic signals immediately in the rear of such platforms, 3) The Clayton fog signalling machine installed at Post 10 Franklin St be moved to Post 32. For reasons set out in the report, it be laid down as a general principle that signals at gate crossings be not manned solely for the purpose of protecting such gates. Commissioner Canny then directed that the report be considered by the Block & Signal Inspectors in conference. On 6 December 1934, the Secretary was informed that the Block & Signal Inspectors unanimously agreed to the recommendations, subject to minor alterations. On 29 January 1935 the CME agreed to the recommendations, subject to there being an organisation to provide fog-signalmen on the South Yarra - Sandringham and South Melbourne - St Kilda lines should a steam engine be required to operate on these lines during foggy weather. The Chief Engineer, Way & Works, agreed to the recommendations on 5 February 1935. The Chairman of Commissioners was informed on 15 April 1935 that the AGST considered that "I am satisfied that the proposals embodied in the recommendations provide ample security under all conditions of train operation."

Unfortunately, the Secretary reported on 17 May 1935 that "after careful consideration the Commissioners are not prepared at this juncture to authorise the withdrawal of fog signalmen as recommended in the report, but do agree to recommendations 2 (relocation of fog signalmen) and 3 (relocation of fog signalling machine)." By 29 May 1935 the Staff Officer had amended the list of fog signalling posts.

On 19 November 1937 the GST notes that the ARU (Repairers Section) had requested a review of all fog signalling posts within 4 mile of Melbourne as they consider that some of the posts are dangerous and Clayton Fog-signalling machines should be installed. As a consequence of this request, the Commissioners agreed to install several fog signalling machines on 6 September 1939. They also approved the withdrawal of fog signalman from two homes at Viaduct Junction, and requested a review of fog-signalling positions in Appendix B of the report dated 9 August 1934. The Metropolitan Superintendent stated that, subject to the Block & Signal Inspectors comments, Appendix B should stand. He further stated that "In regard to controlled level crossing it is consided that, excepting locations where train stop fitted signals protecting gates are situated a sufficient distance away to permit of a tripped train coming to rest before reaching the gates, fog signalmen on the South Yarra – Sandringham and South Melbourne – St Kilda lines, on which steam trains rarely run, [are not required and?] it would appear desirable that directions be issued that such trains must not be run during periods of foggy weather." A joint report was produced on 10 December 1939 and submitted to the Commissioners on 28 May 1940. Commissioner Canny again asked the Block and Signal Inspectors, and the 1939 report was unanimously supported by the Inspectors in conference on 24 June 1940. It appears that the altered fog signalling arrangements were then agreed to by the Commissioners, and a number of fog-signalling positions were subsequently abolished.

WALHALLA GOLDFIELDS RAILWAY 2011

Brian Coleman