

SIGNALLING RECORD SOCIETY (VICTORIA)

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Deadline for September 1990 issue is 17 August 1990.  
**NEXT MEETING:** Friday, 20 July 1990.  
**VENUE:** Uniting Church Hall, Hotham Street,  
Mont Albert, commencing at 20.00 hours.

MINUTES OF MAY 1990 MEETING.

**HELD AT:** Hotham Road, Uniting Church Hall, Mont Albert.

**HELD ON:** Friday, 18 May 1990.

**MEETING COMMENCED:** at 2014 hours following the reconvened AGM.

**PRESENT:** Jack McLean, Wilfrid Brook, Jon Churchward, Glenn Cumming,  
Graeme Inglis, Roger Jeffries, Keith Lambert, Andrew McLean  
and Greg O'Flynn.

**APOLOGIES:** Peter Brook.

**VISITORS:** Andrew Ward.

**MINUTES OF PREVIOUS MEETING:** not available.

**CORRESPONDENCE:** A draft of the Upfield Railway Heritage Study was received  
from Andrew Ward.

**GENERAL BUSINESS:** 1. Upfield Line. Andrew Ward spoke on his role in advising  
the PTC what structures were significant on the Upfield  
line. He suggested that station buildings could be leased  
or sold. There were two houses of significance - those  
occupied by the gatekeeper at Brunswick Road and the SM  
Moreland. The question arose as to what to do with the  
other buildings such as the gatekeepers cabins at Park  
Street, Brunswick Road, Albion Street and Barkly Street  
which were built when the line was opened. As far as the  
signal boxes at Jewell and Brunswick are concerned, he  
suggested that they be preserved and maintained by the

SRSV. Jon Churchward found this an interesting suggestion and added that SRSV members who do not understand mechanical interlocking frames could learn from those members who do. Greg O'Flynn asked if the Brunswick City Council would provide external maintenance to which Andrew replied that the Council would not know at this stage. He suggested that the SRSV talk to the Brunswick Heritage Committee. Jack McLean mentioned that there were four or five people mechanically minded and capable of maintaining these boxes but added that he could not speak for them. Andrew McLean suggested that the boxes remain electrically connected so that block instruments could be used. Greg O'Flynn stated that the SRSV would have to be incorporated as the Society would be working with the public if it maintained the signal boxes. The motion was proposed that the meeting agree in principle that Jack McLean act as negotiator between Andrew Ward and the SRSV. (O'Flynn/Churchward). The motion was carried.

The secretary will write to Andrew Ward supporting the Society's active involvement in the preservation of these signal boxes. Andrew Ward then spoke about the station building at Gordon which has been leased to the ARHS.

2. Glenn Cumming reported that the lop brackets at Melton now had guy ropes.
3. Glen suggested that anyone wanting to see Lethbridge should visit it soon because it is proposed to close it as an electric staff station as trains can no longer cross there. For some months the platform road has been too close to the loop road as it was moved because vehicles were striking the platform.
4. Jon Churchward reported on what he had heard regarding the collision between the train hauled by 3801 and the interurban train near Hawksbury River. The steam train made a sight brake application on the curve at the bottom of the grade and on one carriage the brakes did not release. At the same location the gauge of the track was 16mm too tight adding an equivalent of 100 tons to the load. The train had also just passed over a flange greasing machine and before stopping. No brake application had been made by the following electric train at the time of the impact and the driver was killed as he jumped. The media had reported that an emergency brake had been applied. This was not correct - a main valve leading to a tank under a carriage (and which supplied a stove) was turned off in case of fire. Two weeks before the accident, work had been carried out on the signalling system. On Tuesday 5 May an interurban train nearly ran into an electric train shunting at Cowan.

MEETING CLOSED: at 2105 hours.

SYLLABUS ITEM: Jon Churchward screened 23 slides of Victorian locations (except one - Newcastle) taken in the 1950's and 1960's. A variation from this theme was to identify the location of a well known publicity photograph of the "Spirit of Progress" taken in 1937 - the location was Ballarat.

SIGNALLING ALTERATIONS

- 2.4.1990 BARNAWATHA. Extra red flashing lights were provided at Havelock Street flashing lights. (O 210/90)
- 6.4.1990 ELTHAM. Signalling diagram No 7'90 (Watsonia-Hurstbridge) became effective and diagram No 45'88 was cancelled. The alterations are as follows:-
1. No 12 points relocated 9m in down direction.
  2. The connection to No 5 at down end removed and track baulked. A new set of points with rodded derail at up end was provided operated by lever 13.
  3. The catch points in No 4 road (up end) were relocated 35m in down direction and operated by No 14 lever.
  4. Signal post 7, lever 19, relocated and applies from No 5 road.
  5. Signal post 5, lever 18, relocated 30m in down direction.
  6. Signal post 10, levers 22 & 23, relocated 25m in down direction.
  7. Derail at down end of No 2 road relocated 14m in down direction.
  8. Derail at up end of No 2 road relocated 10m in down direction.
  9. Derail at down end of No 4 road was relocated 4m in up direction.
  10. Signal post 6, lever 17, relocated 10m in down direction.
- BOOK OF SIGNALS:-
- Alter particulars for post 7 to read Ground Disc from No 5 to Main Line.
- Alter particulars for post 5 to read Ground Disc from No 4 to Main Line. (O 2248/90)
- 20.4.1990 ARARAT A BOX. The following alterations were carried out:-
1. Up home signal post 20 was abolished.
  2. Disc signal post 18, controlled by levers 27 and 28, was abolished.
  3. Levers Nos 27, 28 and 61 were sleeved normal. (O 200/90)
- 20.4.1990 ARARAT A BOX. The following alterations were carried out:-
1. Up home signal post 22, lever 59, abolished.
  2. Disc on post 22, lever 58, abolished.
  3. Disc on post 10, lever 9, abolished.
  4. Levers 9, 58 and 59 sleeved normal. (O 205/90)
- WN 16/1990 MURRAWA SIDING. Commencing forthwith and until further notice, the Mt Gambier end of Murrawa siding is closed due to poor track conditions. The points have been clamped and spiked. In addition targets have been erected. (O 217/90)
- 24.4.1990 DENILIQVIN. The down inner home signal was abolished. (O 220/90)
- 27.4.1990 WARRAGUL. Post 2, down home arrival signal, was relocated 46m in the up direction. Amend diagram No 16'88. (O 231/90)
- 29.4.1990 JACANA LOOP. The up end points were relocated 30m in the down direction. Amend diagram No 14'86. (O 214/90)
- 1.5.1990 WILLIAMSTOWN. The motor operated semaphore arms on posts 71, 72 and 75 were replaced by light signals. Amend diagram 37'88. (O 2258/90)
- 2.5.1990 BRIGHTON BEACH. B497 was altered to reverse stagger. Amend diagram No 27'88. (O 2282/90)

- 3.5.1990 SPRINGHURST. The following alterations were carried out:-
1. Posts 5, 6 and 7 were abolished.
  2. The lower LH arm post 4 was abolished and the upper LH arm is now controlled by lever 37 and applies from No 2 road to the Wodonga line.
  3. Points 23, 34 and 28 were abolished.
  4. Plungers 22, 27 and 33 were abolished.
  5. Deraill 24 was abolished.
  6. Levers 22, 23, 24, 27, 28, 33, 34, 36, 40 and 44 were sleeved normal.
  7. A location board was provided on the Wahgunyah line.
- Amend diagram No 2'82. (O 218/90)
- 5.5.1990 FLINDERS STREET. Guards Indicators were provided on the external walls of the indicator cabins on platforms 3, 5 and 7 and apply as follows:-
- | Road | Signal | Comments             |
|------|--------|----------------------|
| 3    | 329    | West End             |
| 5    | 573    | West End             |
| 7    | 731    | West End (O 2286/90) |
- 5.5.1990 WEST TOWER. Points 261U and 263U were removed. Compound points 265U and 267U were removed. D and H roads were abolished. Amend diagram No 36'86. (O 242/90)
- 6.5.1990 JACANA. Automatic signal E557 was relocated 25m in the up direction. Amend diagram No 3'89. (O 2280/90)
- 8.5.1990 WEBB DOCK. An additional flashing light mast was provided at the level crossing at No 27-32 South Wharf entrance (4.131km) on the upside of the crossing and the upside of the line. The crossing is now an entrance and exit to No 27-32 South Wharf. (O 233/90)
- 3.6.1990 BENALLA LOCOMOTIVE DEPOT. The locomotive depot will be closed. A special train hauled by J515 was run from Seymour to Benalla and on to Goorambat for the occasion.
- 9.5.1990 KOONWARRA. The South Gippsland Highway level crossing was relocated 30 metres in the up direction due to road realignment works. Healthy state lights were provided. (O 211/90)
- 15.5.1990 BROADMEADOWS. The crosslocked connection from the down main line to the refuge siding was abolished. Lever 10 was sleeved normal. (O 2325/90)
- 23.5.1990 WANGARATTA. Strobe flashing lights were provided at Boorhaman Road level crossing at 238.492km. (O 292/90)
- 24.5.1990 WANGARATTA-SPRINGHURST. Flashing lights were provided at Summers Road level crossing at 247.303km. The crossing is controlled by predictors and healthy state lights are fitted. (O 289/90)
- 29.5.1990 BENDIGO. New signalling diagrams Nos 26'90 (North Bendigo Junction) and 28'90 (Bendigo) became effective and diagrams Nos 42'89 and 44'89 were cancelled. The alterations were as follows:-
1. The mechanical signal boxes - A, B, C and D - were abolished and replaced by a relay control panel on the down platform.
  2. All mechanically operated points and signals were abolished.
  3. The new points and signals in Bendigo yard are power operated.
  4. The double line block telegraph section is now Castlemaine-Bendigo (prev Castlemaine-Bendigo A-Bendigo B).

5. The staff and ticket section Bendigo-North Bendigo Junction was abolished and the section of line becomes part of Bendigo yard.
6. Train order working commences at North Bendigo Junction for both the Eaglehawk and Echuca lines.
7. The interlocked gates at Nolan Street and Williamson Street were replaced by boom barriers.
8. Healthy state lights were provided at Oak Street, Williamson Street, Mundy Street, Nolan Street, Powell Street, Napier Street, Weeroona Avenue and Thunder Avenue level crossings.  
(O 290/90)

- WN 21/1990 WANGARATTA. Signalling diagram No 34'90 became effective and diagram No 6'87 was cancelled. Alterations shown include the removal of sidings at the up end of No 1 road and the deletion of the intermediate staff hut at Alumatta. (Note: Alumatta is still shown but is booked out and is unlikely to be used again.)  
(O 312/90)
- WN 21/1990 REDCLIFFS-MILDURA. Signalling diagram No 14'90 became effective and diagram No 16'82 was cancelled. Alterations shown include the master key name changes following train orders. (O 313/90)
- WN 21/1990 NAGAMBIE-TOOLAMBA. Signalling diagram No 24'90 became effective and diagram No 24'88 was cancelled. Alterations shown include track rationalisation at Nagambie, Murchison East and Toolamba, and the provision of TAILS at these stations. (O 314/90)
- WN 21/1990 KILMORE EAST. Signalling diagram No 36'90 became effective and diagram No 40'86 was cancelled. Alterations shown include the removal of the up refuge siding. (O 315/90)
- WN 21/1990 WODDONGA & COAL SIDINGS. Signalling diagram No 32'90 became effective and diagram No 14'87 was cancelled. Alterations shown include the removal of the BG Uncle Bens siding and removal of the BG from the old stock sidings area. (O 316/90)
- WN 21/1990 SYDENHAM-GISBORNE. Signalling diagram No 30'90 became effective and diagram No 30'86 was cancelled. Alterations shown include the removal of the goods sidings from Sydenham, Diggers Rest, Clarkefield and Gisborne. Sydenham, Diggers Rest and Clarkefield retain a main line crossover whilst Gisborne has the up refuge and a 28m siding on the down side presumably for track machines. (O 317/90)
- WN 21/1990 INVERLEIGH-MAROONA. Signalling diagram No 12'90 became effective and diagram No 10'86 was cancelled. Alterations shown include the removal from the diagram of the loops that were spiked out when train orders were introduced viz Wingeel, Berrybank, Derrinallum, and Westmere. The location of TAILS is also shown together with the altered track layout at Maroona. (O 318/90)
- WN 21/1990 WILLAURA LOOP-GRAMPIANS LOOP. Signalling diagram No 22'90 became effective and diagram No 26'86 was cancelled. Alterations shown include the locations of TAILS equipment. Passenger platforms are still shown at Willaura, Glen Thompson and Dunkeld although passenger trains have not operated for some time. (O 319/90)
- WN 21/1990 BARRY BEACH JUNCTION-WELSHPOOL. Commencing forthwith and until further notice, this section is booked out of service. Baulks have been provided at 190.300km which is 400 metres on the down side of Barry Beach Junction. (O 324/90)

- 28.5.1990 BENDIGO. From this date, train order working for Echuca line trains will commence and finish at post 36 (up home signal protecting North Bendigo Junction). Train orders will be issued to drivers at Bendigo. A train order must not be issued if an unfulfilled order exists for the Bendigo-Elmore section or if a movement is taking place between posts 26 and 36. The train controller must inform the signalman when the order has been issued and the signalman can then place the necessary signals to proceed. After the train order has been issued, no train or locomotive is permitted to occupy the single line between posts 26 and 36 until the down Echuca line train has cleared post 36, or the train order has been cancelled. (O 335/90)
- 2.6.1990 BROOKLYN. The following alterations were made:-
1. Crossover points H and F between Nos 2 and 3 roads were abolished.
  2. Points E and C between Nos 1 and 2 roads were abolished and a new turnout B provided 5486m in the up direction from existing points D.
  3. The extension from No 1 road to the Tottenham line and the connection to the Wash Dock Sidings were abolished.
  4. Dwarf signal post 3 was abolished.
  5. Disc signal on post 2 was abolished.
  6. Home signal No 1 will apply to post 5 and detect points A normal and points D reverse.
  7. Home signal No 2 will apply to post 4 and detect points D normal.
  8. Home signal No 6 will apply to the Tottenham line and detect points B normal.
  9. Home signal No 7 will apply to the Sunshine line and detect points B reverse.
- Amend diagram No 40'81. (O 337/90)
- 28.5.1990 BENDIGO. Train order working for up and down Piangil and Korong Vale trains will finish and commence at home signal No 34 (up home signal protecting North Bendigo Junction). The train order is issued to the Driver at Bendigo and when it has been issued, the signalman is informed by the Train Controller, and then if the line is clear, the fixed signal can be exhibited. A train order is not to be issued if an unfulfilled train order exists for either the Bendigo-Inglewood or Bendigo-Dingee sections, or a movement is taking place in the single line section between posts 26 (up home signal for Bendigo station) and 34. After a train order has been issued for a down Korong Vale or down Piangil train the single line must not be obstructed until the train has passed clear of post 36 or the train order has been cancelled. (O 344/90)
- WN 21/1990 EAGLEHAWK. A qualified employee must be in attendance for all movements to and from the Inglewood line. He must be on duty 30 minutes before the up train is due and prior to a down train departing Bendigo. The Train Controller must not issue a train order until the employee is in attendance. The normal position of the signals applicable to the Piangil line is proceed and signals for the Inglewood line must be at stop. (O 344/90)
- WN 22/1990 WALLAN - Block Hours.
- Mon-Thur - switched in from 0545 until 2300 each day.
  - Friday - switched in from 0545 until 0050 on Saturday.
  - Saturday - switched in from 1615 until clearance of 8337.
  - Sunday - not switched in. (O 338/90)

- 7.6.1990 GEELONG. A rotating warning light and bell was installed on the foot crossing over No 9 road and gives 25 seconds of warning at 25km/h. (O 351/90)
- WN 22/1990 WEDDERBURN JUNCTION. Following curve realignments (the former platform alignment was removed) the curve speed boards were removed. The speed limit between 234.397km and 234.854km was raised from 55km/h to line speed. (O 355/90)
- 5.6.1990 GEELONG. The Freightgate was relocated to North Geelong on the west side of the station at the Melbourne end.
- 8.6.1990 DANDENONG-LYNDHURST. Containers Siding was abolished. The up and down end staff locked points and derails were removed. Amend diagram No 7'85. (O 374/90)
- 14.6.1990 TRARALGON. Signalling diagram No 20'90 (Traralgon-Sale) became effective and diagram No 10'74 (Traralgon) was cancelled. The alterations were:-
1. The interlocked signal box and ground frame were abolished. The staff instrument for the Morwell section was relocated to the station building.
  2. Two signal quadrants and a pilot quadrant were provided on the platform.
  3. All signals except for the right hand arm on post 2, the left hand arm on post 12 and post 20, were abolished. These posts were renumbered 1, 2 and 3 respectively and became signals A, D and E.
  4. The inner crossovers at both ends between No 1 and 2 roads were removed together with the up end connection to the loco sidings and the Maffra Dock.
  5. The main line points leading to No 2 road at both ends were provided with plunger locks and the points leading to the loco sidings and the car sidings were provided with B pattern annett locks the key of which is normally kept in a duplicate lock on the pilot lever. The pilot lever normal prevents either signal quadrant from being operated.
  6. Signal E is operated by a 5P key switch at the platform and points C, and a repeater is provided at both locations.
  7. Healthy state lights were provided at Liddiard Street flashing lights. (O 377/90)
- WN 23/1990 BROOKLYN. Due to track alterations the following method of signalling of trains and light locomotives through Brooklyn will be as follows:-
- Signalled Moves
- a. Home signal post 1 (Newport-Sunshine Loop Line) applies to post 5 West Line and detects points A normal and D reverse.
  - b. Home signal post 2 (Tottenham-Brooklyn Loop Line) applies to post 4 East Line and detects points D normal.
  - c. Home signal post 6 (East line) applies to the Tottenham-Brooklyn Loop line and detects points B normal.
  - d. Home signal post 7 (West line) applies to the Newport-Sunshine Loop Line and detects points B reverse.
- NOTE:- A short section of single line exists between post 1 and 2, and posts 4 and 5. The track circuits and detection of the points is designed to allow only one train at a time over the single line. The remaining movements are non-signalled and drivers must only pass the home signals at stop when authorised by the signalman, after the correct road has been set and the Somerville Road boom barriers have been activated. (O 364/90)

- 20.6.1990 EPPING. The rail security gates were brought into service. The gates are controlled from the signal panel by buttons 701 and 719. (O 2443/90)
- WN 24/1990 RIDDELLS CREEK - Block Hours.  
Switched in only as arranged by Duty Operations Manager, Control. (O 404/90)
- WN 24/1990 DONALD. A through Train Order may be issued for 9118 Express Goods. (O 405/90)
- 21.6.1990 MILDURA. Flashing lights were brought into service at Thirteenth Street at 574.486km. Healthy state lights were provided. (O 390/90)
- 20.6.1990 ECHUCA. The Sturt Street level crossing was relocated and down home signal No 7 was relocated 75 metres in the up directio. (O 389/90)
- WN 24/1990 TRAIN TO BASE RADIO CHANNELS and ASSOCIATED LIST OF ROUTES.  
Channel
- 1 SOUTH WESTERN VICTORIA - Melbourne-Warrnambool & North Geelong-Gheringhap
  - 2 WESTERN VICTORIA - Melbourne-Ararat, Gheringhap-Ararat, Ararat-Portland & Heywood-Mount Gambier
  - 3 NORTH WESTERN VICTORIA -Gheringhap-Mildura, Ararat-Castlemaine.
  - 4 NORTHERN VICTORIA - Melbourne-Piangil, Bendigo-Kulwin and Robinvale, Dunolly-Inglewood & Bendigo-Moulamein & Deniliquin.
  - 5 NORTH EASTERN VICTORIA - Melbourne-Albury, Benalla-Oaklands, Seymour-Cobram, Shepparton-Dookie & Toolamba-Echuca.
  - 6 NORTH EASTERN (Standard Gauge) Melbourne-Albury. Ararat-Wolseley and branches.
  - 7 EASTERN & SOUTH EASTERN - Melbourne-Bairnsdale and Melbourne-Korumburra.
  - 8 METROL WESTERN AREA - Western Metropolitan Area.
  - 9 METROL EASTERN AREA - Eastern Metropolitan Area, Melbourne-Stony Point and Long Island.

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## TRAIN CONTROL

For many years the control of trains was in the hands of control rooms scattered throughout the country. These control rooms were a vital part of operations not only deciding how the trains should occupy the main lines but also where they should shunt, change crews, cross other trains, etc. Stock traffic was generally directed from these rooms and in Seymour one of the clerks performed a double job that of movements of stock wagons and rostering of guards. With the reduction of train numbers for a variety of reasons, it was decided that all these functions could be performed from the control offices in the new railways head office in Collins Street. Thus the rooms were gradually closed and so passed into history a small part of railway life. Even though the local station could quiet at night, the control room was always an interesting place to visit.

Location	Closed	Location	Closed
Geelong Control	20 Dec 1987	Bendigo Control	xx.xx.1988
Ballarat Control	1 July 1988	Seymour Control	8 May 1988
Ararat Control	31 Jan 1988		

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VICTORIAN RAILWAY  
THREE POSITION SIGNALS  
DATES OF INSTALLATION

Original list compiled by John Sinnatt and Jack McLean  
and published in Clear Normal Speed. The present list  
based on the original was compiled by David Langley.

COUNTRY LINES

SOUTH WESTERN

EAST LINE (S) - Original Main Line.	
Newport "B" - Manor	1928 - Mar 15 (1)
Manor - Lara	1928 - Jul 15
Lara North Geelong "A"	1928 - Sep 4
WEST LINE (S) - (2)	
Newport "B" - Rock	1967 - Oct 22
Rock - Laverton	1965 - May 30
Laverton - Werribee	1968 - Sep 1
Werribee Station	1973 - Oct 28
Werribee - Little River	1970 - Oct 25
Little River Station	1972 - Oct 8 (9)
Little River - Lara	1981 - Jul 27
Lara Station	1973 - May 25
Lara - Corio	1981 - Sep 19
Corio - North Geelong "A"	1959 - Feb 8
Geelong "A" Rox	1979 - May 12 (2A)
Geelong-South Geelong	1989 - Dec 10 (20)

WESTERN

Sunshine - Rockbank (S)	1976 - Oct 4 (10)
Sunshine - Deer Park West Jcn (S)	1976 - Oct 4 (11,12)
Rockbank - Melton (S)	1990 - Jan 21 (21)
Melton - Bacchus Marsh (S)	1987 - Oct 17 (22)
Parwan Loop	1984 - Feb 4 (22)
Bacchus Marsh - Ballan (S)	1963 - Apr 7 (13)
Ballan - Warrenheip (S)	1987 - Dec 13 (23)
Bungaree Loop	1985 - Mar 29 (23)
Ararat Station (down end)	1984 - Nov 10
Ararat - Pyrenees Loop - Great Western Loop	1985 - Jun 14 (18)
Great Western Loop	1984 - Oct 30 (18)
Great Western Loop - Deep Lead Loop	1985 - Jul 26 (14)
Deep Lead Loop	1984 - Dec 10 (18)
Deep Lead Loop - Lubeck Loop	1985 - May 10 (19)
Lubeck Loop - Murtoa	1985 - Jan 29 (19)
Murtoa Station	1984 - Oct 8 (19)
Murtoa - Murtoa Loop - Horsham	1983 - Nov 11 (14)
Horsham Station	1975 - Mar 13 (15)
Horsham - Dimboola	1983 - Dec 11 (14)
Pimpinio Loop	1982 - Jul 25 (15)
Dimboola Station	1983 - Nov 26 (16)
Dimboola - Dimboola Loop - SL - Nhill	1984 - Mar 3 (14)
Salisbury Loop	1970 - Aug 6 (16,17)
Nhill Station - Diapur Loop	1984 - Apr 6 (14)
Diapur Loop - Leeor Loop - Wolseley	1984 - May 1 (14)

NORTHERN & MIDLAND

Castlemaine "A" - Maldon Junction (S)	1926 - Nov 28 (3)
Castlemaine Station	1989 - May 30
Bendigo - North Bendigo Jcn	1990 - May 29
Maryborough Station	1969 - Jun 28

## NORTH-EASTERN (BROAD GAUGE)

Somerton Station	1962 - Aug 5
Tallarook - Goulburn Junction	1925 - Aug 16 (24)
Goulburn Junction - Seymour "A" (S)	1925 - Aug 16
Goulburn Junction - Seymour "A" (D)	1942 - May 17
Goulburn Junction - Seymour "A" (S)	1961 - Nov 26 (4)
Seymour Station	1989 - Jul 28 (25)
Wodonga - Coal Sidings Box (S)	1964 - May 10 (5)
Coal Sidings Box - Albury South (S)	1962 - May 14 (5)

## NORTH-EASTERN (STANDARD GAUGE)

Spencer Street - South Dynon Junction (S)	1962 - Apr 12
West Footscray Junction - Somerton Loop (S)	1962 - Apr 15 (6)
Somerton Loop - Broadford Loop (S)	1962 - Jul 9 (6)
Broadford Loop - Seymour Loop (S)	1962 - Apr 8 (6)
Seymour Loop - Benalla Loop (S)	1962 - Aug 20 (7)
Benalla Loop - Alumatta Loop (S)	1963 - Feb 4 (7)
Alumatta Loop - Wodonga (S)	1962 - Mar 18 (8)
Wodonga - Coal Sidings Box (S)	1964 - May 10 (5)
Coal Sidings Box - Albury South (S)	1962 - May 14 (5)

## EASTERN

Dandenong - Narre Warren	1956 - Nov 18
Narre Warren - Berwick	1962 - Feb 25
Berwick - Officer	1956 - Mar 13
Officer - Pakenham	1955 - Feb 27
Pakenham Station	1954 - Dec 19
Pakenham - Nar Nar Goon	1954 - Oct 10
Nar Nar Goon - Tynong	1953 - Jun 28
Tynong Station	1957 - Apr 7
Tynong - Bunyip	1956 - Aug 19
Bunyip - Longwarry (S)	1988 - Aug 26 (26)
Longwarry - Warragul	1988 - Aug 26
Drouin Station	1958 - Jul 29 (27)
Warragul - Yarragon	1988 - Aug 7
Yarragon - Trafalgar	1958 - Mar 23
Trafalgar - Moe	1960 - Jun 27
Moe - Morwell (S)	1966 - Jul 3

## SUBURBAN LINES

## PORT MELBOURNE and ST. KILDA

Flinders Street "A" Box - Inglis Street	1919 - Jun 8 (32)
Inglis Street - Port Melbourne	1969 - Dec 14 (19,32)
Flinders Street "A" Box - St Kilda	1919 - Dec 7 (33)
St Kilda Station	1928 - Oct 14 (1,33)

## SANDRINGHAM

Flinders Street "E" Box - Richmond	1918 - Sep 1
Richmond - Prahran	1915 - Oct 4
Prahran - Ripponlea	1917 - Dec 16 (2)
Ripponlea - Elsternwick	1918 - May 13
Elsternwick - Brighton Beach	1926 - Jul 18
Brighton Beach - Sandringham	1926 - Dec 19

## CAULFIELD THROUGH LINES AND FRANKTON

Flinders Street "E" Box - Richmond	1919 - Jun 1
Richmond - Hawksburn	1915 - Oct 4
Hawksburn - Caulfield	1921 - Dec 18
Caulfield Power Box	1933 - Nov 26

Caulfield - Glenhuntly	1933 - Nov 26
Caulfield - Moorabbin (S)	1987 - Aug xx
Glenhuntly Station	1987 - May xx
Glenhuntly - Bentleigh	1974 - Nov 10
Bentleigh - Patterson	1961 - Jun 25
Patterson - Highett	1958 - Jan 19
Highett - Cheltenham	1972 - Dec 12
Cheltenham - Parkdale	1985 - Dec 7
Parkdale - Mordialloc	1986 - Apr 5
Mordialloc Station	1987 - May xx
Mordialloc - Chelsea	1977 - Jan 23
Chelsea - Carrum	1976 - Dec 19
Carrum - Frankston	1976 - Oct 29

## CAULFIELD LOCAL LINES AND DANDENONG

Flinders Street "E" - South Yarra	1960 - May 2
South Yarra - Hawksburn	1915 - Oct 4
Hawksburn - Caulfield	1921 - Dec 18
Caulfield - Carnegie	1933 - Nov 26 (3)
Carnegie - Oakleigh "A"	1940 - Dec 8 (4)
Oakleigh Station	1975 - May 11
Oakleigh "B" - Clayton	1970 - Dec 6
Clayton - Westall	1971 - Jul 25
Westall - Springvale	1972 - Feb 20
Springvale Station	1975 - Feb 16
Springvale - Dandenong	1971 - May 9 (28)
Dandenong Station	1929 - Jun 23

## LILYDALE AND BELGRAVE

Flinders Street "E" - Richmond	1919 - Jun 1
Richmond - East Richmond	1919 - Aug 31
East Richmond - Hawthorn	1922 - Oct 15 (5)
Hawthorn Station	1925 - Jun 14
Hawthorn - Camberwell	1922 - Oct 29 (5,6)
Camberwell Station	1924 - Jun 22
Camberwell - Canterbury	1922 - Nov 5 (5,8)
Canterbury - Surrey Hills	1927 - Mar 30
Surrey Hills - Box Hill	1929 - Oct 20
Box Hill Station	1930 - Jun 15
Burnley Through Lines	
Flinders St "D" - Richmond	1973 - Feb 4
Richmond - Burnley	1967 - Jan 9 (20)
Centre Line (S) (7)	
Burnley - Hawthorn	1972 - Aug 13
Hawthorn - Camberwell	1963 - Dec 8
Camberwell - East Camberwell	1964 - Nov 8
East Camberwell - Box Hill	1971 - Dec 19
Box Hill - Blackburn	1958 - Jul 13 (26)
Blackburn - Mitcham	1960 - Nov 13
Mitcham - Ringwood	1958 - Sep 7
Ringwood Station (up end)	1958 - Oct 26
Ringwood Station (dn end)	1973 - Dec 2
Ringwood - Croydon (S)	1973 - Nov 11
Ringwood - Croydon (D)	1984 - Jun 30
Croydon - Mooroolbark	1984 - Jun 30
Mooroolbark - Lilydale (S)	1985 - Jun 29
Lilydale Station	1985 - Jun 15
Ringwood - Bayswater (S)	1974 - Jun 30
Ringwood - Bayswater (D)	1982 - Feb 11
Bayswater Station	1982 - Sep 11
Bayswater - Ferntree Gully	1977 - Jul 24

Ferntree Gully - Upper Ferntree Gully (S)	1964 - Mar 18
U.F.G. - Belgrave (S) (762mm gauge)	1921 - Dec 22 (9)
U.F.G. - Belgrave (S) (1600mm gauge)	1964 - Mar 17

## GLEN WAVERLEY

Burnley - Heyington	1926 - Aug 8
Heyington - Tooronga	1957 - Dec 15
Tooronga Station	1966 - May 29
Tooronga - Glen Iris	1957 - Nov 10
Glen Iris - Darling	1956 - Mar 18
Darling Station	1976 - Aug 29
Darling - Eastmalvern	1956 - Jun 24
Eastmalvern - Mt Waverley (S)	1958 - Sep 7 (10)
Eastmalvern - Mt Waverley (D)	1964 - Jun 28
Mt Waverley - Syndal	1958 - Sep 7
Syndal - Glen Waverley (S)	1958 - Sep 7 (10)
Syndal - Glen Waverley (D)	1964 - Nov 29 (1)

## ALAMEIN

Camberwell - Riversdale (S)	1955 - Jul 31 (7,11)
Camberwell - Riversdale (D)	1959 - Nov 29 (12)
Riversdale - Hartwell	1955 - Jul 31
Hartwell - Ashburton	1962 - Nov 8
Ashburton Station	1977 - Aug 2 (21)

## EPPING

Flinders Street "D" Box	1926 - Apr 11
Flinders Street "D" - Clifton Hill	1921 - Apr 3
Clifton Hill Station (incomplete)	
Clifton Hill "B" - Northcote Loop Junction	1926 - Sep 19 (34)
Northcote Loop Junction - Merri	1961 - Jul 30 (34)
Merri - Thornbury	1987 - Oct 4
Thornbury - Bell	1987 - Oct 18
Bell - Reservoir	1988 - Apr 17
Reservoir - Keon Park	1988 - May 8
Keon Park - Lalor (S)	1988 - Jun 19 (35)
Lalor Station	1988 - Aug 22 (35)
Lalor - Epping (S)	1989 - May 14 (35)

## HURSTBRIDGE

Clifton Hill "B" - Westgarth (S)	1926 - Sep 19 (7)
Westgarth Station	1968 - Jun 30
Westgarth - Fairfield	1964 - Sep 1
Fairfield Station	1969 - Nov 2
Fairfield - Alphington	1964 - Sep 2
Alphington Station	1966 - Jul 17
Alphington - Ivanhoe	1951 - Dec 16
Ivanhoe - Heidelberg	1949 - Jun 19
Heidelberg (dn end) - Macleod	1958 - Dec 14
Macleod - Greensborough	1979 - Aug 12

## FLINDERS STREET STATION

"A" Box	1980 - Dec 12
"B" Box	1982 - Mar 27
"C" Box	1982 - Jun 18
"D" Box	1926 - Apr 11

## FLINDERS STREET - NORTH MELBOURNE

Flinders Street "A" - Viaduct Junction North Viaduct and South Viaduct lines.	1917 - Dec 2
Flinders St - Spencer Street No 2 Box (25) Through Suburban lines	1978 - Dec 11 (29)
Loop Viaduct lines	1980 - Nov 16 (30,7)
Spencer Street No 2 - Flinders St "D" & "E" City Circle & Clifton Hill U'ground Loop	1982 - Oct 31 (31)
Burnley Underground Loop	(31)
Northern Underground Loop	1984 - Apr 1 (27,31)
Caulfield Underground Loop	(31)
Viaduct Junction - Spencer Street No 1 Box	1917 - Dec 2 (13)
Viaduct Junction - Franklin Street	1924 - Aug 17 (14)
Viaduct Jcn - Franklin Street Special lines	1925 - Dec 13
Spencer Street South End Box	1962 - Sep 21
Spencer Street No 1 Box	1961 - Oct 14
Spencer Street No 1 Box - Franklin Street	1924 - Aug 17
Franklin Street - North Melbourne	1924 - May 25

## MELBOURNE GOODS YARD

West Tower (replacing Weighbridge Junction)	1968 - Dec 1
Melbourne Hump Yard	1968 - Dec 29

## UPFIELD

North Melbourne - Macaulay	1928 - Jun 10
Macaulay - Royal Park	1972 - Apr 8
Royal Park - Jewell	1971 - Aug 22

## BROADMEADOWS

North Melbourne - Kensington (Country Lines)	1918 - Oct 27
North Melbourne - Kensington (Suburban Lines)	1924 - Jan 20
Kensington - Essendon	1918 - Jun 17 (15)
Essendon Station	1969 - Nov 16
Essendon - Broadmeadows	1965 - Nov 15

## ST. ALBANS

North Melbourne - South Kensington	1928 - Jun 28
South Kensington Station	1928 - Oct 21
South Kensington - Footscray	1976 - Nov 21 (22)
Footscray - West Footscray	1927 - Oct 15
West Footscray - Sunshine	1929 - Oct 11
Sunshine Station	1972 - May 21 (23)
Sunshine - Albion	1929 - Jul 1
Albion - St Albans	1930 - Feb 15
St Albans Station	1930 - Aug 1

## WILLIAMSTOWN AND LAVERTON via ALTONA

South Kensington - Footscray	1927 - Aug 7
Footscray Station	1930 - May 4
Footscray - Yarraville "A" Box	1927 - Aug 7
Yarraville "A" Box - Newport	1929 - Mar 24
Newport Station	1967 - Jul 24 (23)
Newport "A" Box - Newport "B" Box	1946 - Mar 31
Newport "B" Box - Altona Junction	1967 - Oct 22 (25A)
Altona Junction - Altona (S)	1967 - Oct 22
Altona - Westona - Laverton (S)	1985 - Apr 11

## OTHER LINES

Newmarket - Flemington Racecourse	1919 - Jul 5 (16)
South Kensington - West Footscray Goods lines	1927 - Oct 16
Albion - Broadmeadows (D)	1929 - Jul 1

Albion - Broadmeadows (S)	1961 - Nov 25 (17)
Spotswood - Newport Power House (S)	1947 - Dec 18 (24)
Franklin Street - Reversing Loop Junction	1962 - Aug 10 (18)

## COUNTRY LINES NOTES

(S) - Single (two-way) Line, (D) - Double Line.

1. Rock & Drome Loops remote controlled 1931 (Aug 16 & Oct 18).
2. Dates include re-signalling of parallel sections of East line.
- 2A. Maitland Street Sidings Junction 1973 - Aug 12.
3. Abolished 1952 (Mar 4).
4. Dysart-Seymour.
5. Lever Locking & Track Control.
6. CTC from Spencer Street 1963 (Mar 4).
7. CTC from Spencer Street 1963 (Feb 4).
8. CTC from Spencer Street 1963 (Jan 21).
9. CTC from Werribee 1973 (Dec 7).
10. North Line Sunshine-Deer Park West Junction.
11. South Line.
12. Deer Park & Deer Park West Junction CTC from Sunshine Box.
13. Bank Box Loop lengthened and resigalled 1982 - Feb 11.
14. CTC from Spencer Street.
15. CTC from Spencer Street 1983 - Dec 11.
16. CTC from Spencer Street 1984 - Mar 3.
17. Lengthened and resigalled 1984 - Mar 3.
18. CTC from Spencer Street 1985 - Jul 26.
19. CTC from Spencer Street 1985 - Jul 20.
20. Geelong B Box abolished. Panel in A Box.
21. Last MES between Melbourne and Ballarat. Rockbank Loop now remotely controlled from Bacchus Marsh.
22. Parwan Loop remotely controlled from Bacchus Marsh.
23. Bungaree Loop remotely controlled from Warrenheip.
24. Abolished 1987 - Mar 3.
25. Post 10 provided 1989 - Jul 12.
26. Single line is worked automatically by the approach of trains.
27. Abolished 1988 - Feb 16.

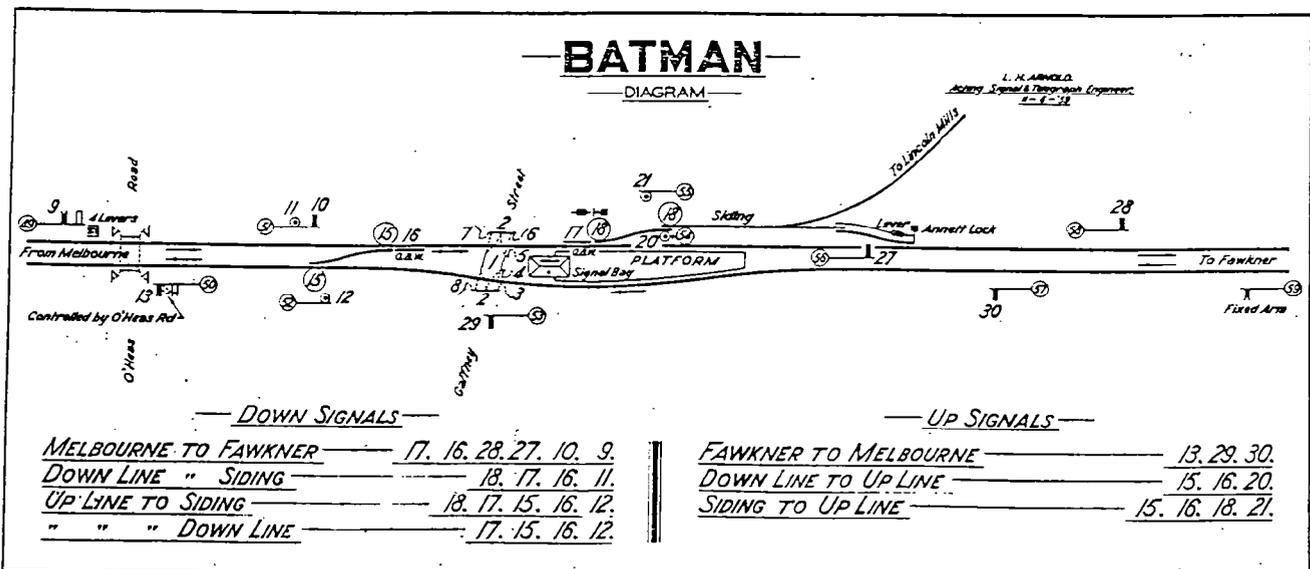
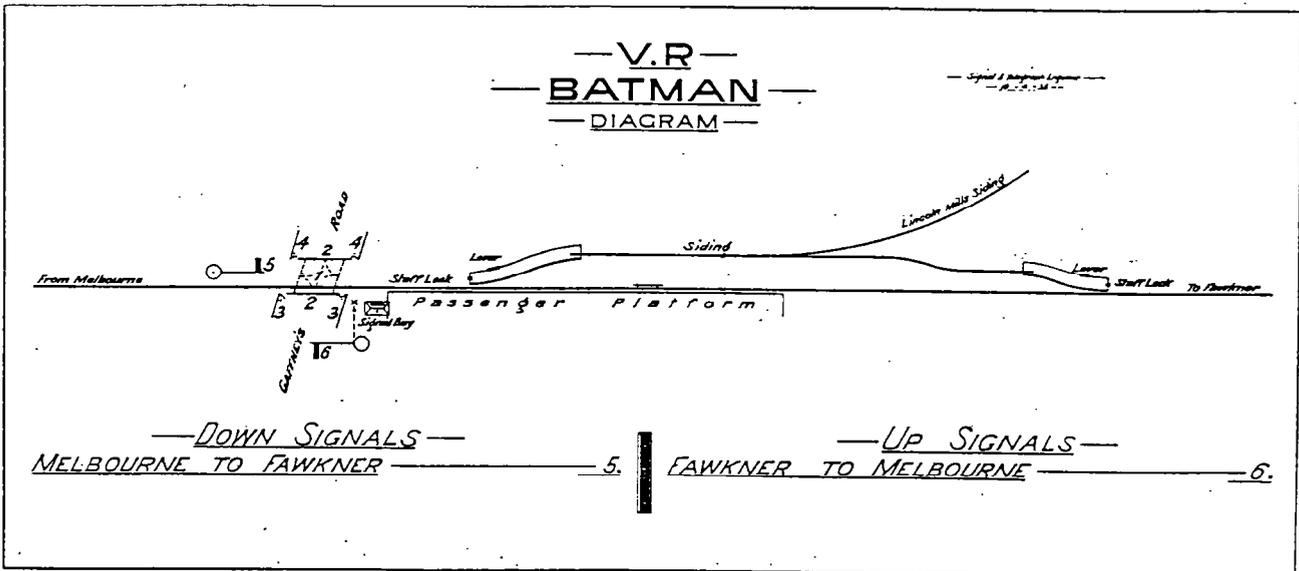
## SUBURBAN LINES NOTES

(S) - Single (two-way) Line, (D) - Double Line.

1. Points work automatically when box is closed.
2. First three-position light signal - B210 - in cutting near Windsor, originally co-acted with semaphore high up on other side but now abolished.
3. First searchlight signal - No 23 at Caulfield.
4. First large scale installation of searchlight signals.
5. First large scale installation of ordinary light signals.
6. Up and Down lines resigalled 1963 - Jul 14 & Nov 10.
7. Lever Locking and Track Control.
8. Re-sigalled 1964 - Nov 8.
9. Abolished 1930 - Aug 28.
10. CTC from Eastmalvern until line doubled.
11. LL&TC 1924 - Nov 2 but two-position signals at Riversdale.
12. LL&TC retained on up line after duplicating.
13. Via old suburban island platform.
14. Via new suburban island platforms.
15. First four-aspect signalling - Kensington-Newmarket.
16. Two-position automatic (light) signals.
17. CTC from Spencer Street 1963 - Mar 25.
18. Victorian Gauge Engine Flyover road.
19. Graham-Port Melbourne singled and now part of Graham yard.
20. Up line 1966 - Aug 1.
21. Ashburton-Alamein (single) now part of Ashburton yard.

22. New main suburban lines.
23. Main lines only.
24. Signals abolished 1972 - Aug 15.
25. Spencer Street No 2 Box replaced Viaduct Junction Box 1978 - Nov 20.
- 25A. Remote control from Newport. Is this the entry?
26. Re-signalled for closer headways 1980 - Oct 19.
27. Northern Underground Loop signals commissioned 1984 - Jan 29.
28. Resignalled for improved headways 1985 - Aug 10.
29. Lines carried on new South Viaduct.
30. Re-signalling of North and (old) South Viaduct lines for two-way running (four lines).
31. Control of Underground Loops transferred to Metrol 198x - xxx xx
32. Line closed 1987 - Oct 11.
33. Line closed 1987 - Aug 1.
34. Resignalled 1987 - Aug 23.
35. Remotely controlled from Epping panel 1989 - Jul 31. (1st Victorian Solid State Interlocking.)

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UPFIELD LINE SIGNAL BOX TOUR  
SATURDAY, 21 APRIL 1990

In accordance with circular F 1257/90, members and friends of the SRSV gathered at Royal Park on Saturday, 21 April 1990, in order to inspect all the places of signalling interest on the Upfield line, currently Victoria's best working museum of mechanical signalling. At that time, it was widely believed that trains would stop running on this line after the end of June.

The tour was due to commence at 0930 but got underway at 0955 after the Safeworking Inspector arrived. Royal Park is the former junction for the line to Fitzroy Goods (and previously the double line inner circle route to Whittlesea) but today only the home signal posts remain, all points having been removed. Three position signalling is in force on the running lines with the result that the signal box is permanently switched out and most levers on the 21 lever machine are sleeved. Due to the cramped conditions inside the signal box, members of the inspection party took turns to inspect and photograph the frame. The signal box diagram had been removed previously.

Using private cars for transport the tour party departed Royal Park for Park Street level crossing which was the next stop. Here the first of the many level crossings equipped with hand operated gates was inspected. Adjacent to the crossing is the gatekeepers cabin which contains a four lever ground frame for locking the pedestrian wicket gates and controlling the up and down signals protecting the gates. However, the lever formerly working the up signal is out of use because the up signal C258 is now controlled by a thumb switch located inside the cabin.

The down signal is a two position mechanical somersault mounted on the same post as the down distant for Jewell. The distant signal is fixed at caution. The home signal is controlled by two gatekeepers through an arrangement known as a "drop off controller" (or slot). In addition, the down home signal is fitted with a reverser due to the signal being the first mechanical signal out of a three position signalled area, being

required because it ensures that the signal is operated for each train rather than left just hanging off with the possibility of an incident occurring.

The inspection party then walked along the Upfield bikeway, which parallels the railway for much of its length, to Brunswick Road level crossing. This crossing is very similar to Park Street. The hand gates are equipped with rotating red flashing lights and are protected by traffic lights for road traffic.

The next crossing, Barkly Street, is located at the up end of Jewell platform and here we found two points worth mentioning. The first is that the levers in the frame are numbered from right to left rather than the normal left to right and secondly C258 is located immediately on the down side of the crossing and replaced the former up starting signal for Jewell. All three level crossings have control over this signal via thumb switches located on the wall of the cabins.

At the other end of Jewell station is Union Street level crossing with its interlocked gates worked from the signal box located on the upside of the line on the down side of the crossing. Three position signalling ends at Jewell and double line block telegraph is worked with Brunswick. Previously double line block was also worked with Royal Park. Jewell is also the point where trains are entered into the Metrol computer via the terminal located in the signal box.

The signal box contains a 31 lever cam and tappett interlocking machine. The gate wheel is at the left hand end and is numbered 1. Only 14 levers are shown as working although 21 levers were working in the 1960's. The yard has been reduced to a loop siding but all points are interlocked. Timber signal posts still exist in the vicinity of Jewell signal box.

The next stop was Albert Street level crossing at the up end of Brunswick station. Again the level crossing is protected by hand gates. The gatekeepers hut is wedged between the level crossing and the up platform. Due to the cramped layout of the cabin, to open the window on the

south side, lever 1 has to be reversed whilst to gain access to the fridge, all four have to be reversed. (Is the fridge only opened whilst up and down trains are passing?)

Brunswick signal box is located at the other end of the station off the end of the down platform. The adjacent gates at Victoria Street are worked from the 20 lever rocker frame. Only four signals are worked now plus the wicket gates making only a total of eight levers working out of 20. Prior to 1966 there were 15 working levers as there were sidings on the upside of the line on the down side of the gates. Brunswick works block telegraph with Jewell and Moreland.

The next stop was the bistro at the hotel adjacent to the Albert Street gates where a very good meal reasonably priced was enjoyed by some of the tour, the others munched on sandwiches and the like.

The tour recommenced at Hope Street where the President joined us. Yet another set of hand gates and another small cabin for the gatekeeper and his four lever frame.

Albion Road level crossing is protected by a set of interlocked gates worked from looks like a signal box but in fact is just a glorified gatekeepers cabin, although much fortified. Anstey has a 16 lever cam and tappett machine housed in a brick signal box on the down end of the upside building. The gate wheel is numbered 16 and the three signal levers are painted more an orange colour than red and all the levers were dressed with white socks on the tops of the levers. Hanging above the lever frame was a new signal box diagram drawn by a computer but in the traditional style. The name is shown as Anstey rather than North Brunswick although Anstey has been the name of the station since December 1942. This box plays no part in the double line block working on the Upfield line (and probably never has) its sole purpose is to work the gates.

The next crossing at Tinning Street was more or less identical to the rest except that socks also dressed the signal levers and the original cabin here had been damaged by fire and so a portable ATCO hut was in use. Presumably the future of the line dictated that no money be spent

on the original cabin.

Moreland signal box contains a 24 lever rocker frame although as the adjacent crossing is now protected by boom barriers, the gate wheel is absent, the booms being worked by lever 23 - the former gate stops lever. All the sidings and points have been abolished leaving just five signal levers and the boom lever working. Previously 18 of the 24 levers were working. Moreland is the location of the working distant signal on the line (the up) and also the only yellow arm between Royal Park and Batman.

The next signal box visited was Coburg although a brief visit was made to Reynard Street gate cabin and gates. Just near Reynard St is the Moreland up distant and the lack of a yellow spectacle glass is indicative of the lack of signalling maintenance on this line.

Coburg signal box is the largest box on the line, the large 1930's style brick building housing a 51 lever cam and tappett machine although there are many spaces. Two sets of manual boom barriers are worked from here - Bell Street at the down end (hand gates until Nov 1962) and Munro Street adjacent to the box (interlocked gates until June 1983). The Munro St booms are directly worked by lever 51 in that the lever must be placed normal to lower the booms but lever 12 (for Bell Street) is more like a direction lever only requiring to be placed normal for down moves. Up trains operate the booms automatically via the motorised up home signal being at proceed.

The station layout at Coburg is unusual in that a single platform is used for up and down trains, the second platform was not provided when the line was duplicated to Fawkner in July 1959. Consequently facing and trailing crossovers are provided to enable down trains to cross over to the platform and return to the down line on departure. The remaining siding is accessed via a single compound near the signal box. Nos 1 & 2 roads are signalled for passenger trains in both directions - with arms and lock bars - although up trains cannot arrive into No 2 road from the north.

O'Heas Road level crossing, the

last set of hand gates was next visited, and we noticed that the gate keepers cabin was quite a different style although it has been there for some time (From duplication? - Ed). On either side of the crossing there are posts carrying home and fixed distant signals. The down signals (O'Heas' Road home signal and Batman's distant) are on a lattice post while the up signals (O'Heas' Road home signal and Coburg's distant) are on a wooden post.

Batman has a combined station and signal box situated at the up end of the island platform. The interlocked gates over Gaffney Street are unusually spaced as the original gates on the single (present down) line were erected with the single line through the upside gates. When the double line was laid, the new up line was laid around the island platform and the upside gates were moved accordingly. Thus we have the unusual situation of the down side gates not actually swinging across the down line, the line being clear of gates even when they are open for road traffic. The wicket gates here are the last of the normally open type in Victoria, the remainder are the old fashion slamming type. The normally open type consist of tubular steel frames with wire mesh and are individually operated by their own lever whereas the slamming type are merely locked in pairs thus Batman has six levers for the wicket gates. The interlocking machine is a 31 lever cam and tappet and there are 18 spaces. Double line block telegraph is worked with Coburg and Fawkner.

Fawkner, the end of the double line, has a 20 lever cam and tappet machine. The platform is actually on the single line beyond the end of double line. The section to Gowrie is worked under the rules for Train Staff and Ticket, a No 3 staff and black ticket boxes being utilised.

Gowrie is an island platform but the second platform road is not connected at the down end resulting in a main line with back platform arrangement. There is no crossing loop but a stabling siding extends towards Melbourne leading off the Back Platform road. The points are motor operated through a simple switching arrangements using an annett key and two lever locks all housed, along with

some thumb switches and indication lights, in a wooden cupboard. The annett key when removed permits the operation of the up home signal quadrant which is located outside on the platform. The up departure light signal is also worked from this quadrant but is free to be worked at any time. When the annett key is taken back into the panel, the motor points can be reversed and trains signalled to or from the back platform via the thumb switches. On the right hand side of the panel is an aperture for the annett key and a slide to operate the motor points. When the key is removed, the slide is locked normal thus the points are normal for main line running, however, when the slide is required to be operated, the annett key must be inserted and turned and the slide operated locks the key in the panel thus preventing main line running. Train Staff and Ticket Rules apply to Upfield using a No 4 staff but staff tickets are no longer issued.

Upfield is the terminus for suburban electric services but the line continues to Somerton although is virtually unused as far as Ford's Siding. There are no sidings at Upfield but the points leading to former Chrysler Siding are still in place although the siding has been abolished. There are three signals, two light signals on either side of Barry Road boom barriers and one down mechanical home signal. The mechanical signal is worked from a quadrant on the platform but the light signals are worked from thumb switches located in another wooden cupboard in the office.

Also in the office is the grey pattern staff instrument for the section to Somerton, an additional galvanometer being provided because of the intermediate ES instrument at Ford's Siding. A master key is also provided for use at Ford's Siding in the event of a failure of the electric staff instruments and a staff is unable to be withdrawn.

The tour concluded at this point with all members thanking our host - Mr. Paul Brock - for conducting us through the many signal boxes and gatekeepers cabins. We also thank the Safeworking Superintendent for permitting this, and all our other tours, to go ahead.

We would also like to thank all the staff we came in contact with for their courteous attitude towards our group and for answering the many

questions that were asked.

The signalling on the Upfield line is still in operation but for how much longer??

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### TAILS

The following article has been reprinted from the March 1989 issue of IRSE News, the journal of the Institute of Railway Signal Engineers. This journal is currently edited by John Francis, former SRSV member, now resident in England.

The State Transport Authority of Victoria (Australia), known as V/Line, introduced during December 1988 an End-of-Train detector system on 16 single line crossing loops. The system had been developed and tested over the previous two years by V/Line in conjunction with KBH Systems Pty. Ltd. and Futurtech Pty. Ltd. who are the manufacturers. Known as "Train Announcement Integrity Location System", or TAILS, the equipment is aimed at improving efficiency on single lines where the automatic electric staff system is employed, much of V/Lines operation falling into this category.

Since the introduction of two-man crewing and the elimination of guard's vans, it is difficult, if not impossible for the train driver, on arriving at an unattended crossing loop, to ascertain that his train is complete, without sending the second person to the rear of the train to check that the end-of-train marker is in place.

The cost effective system which has been introduced informs the driver by radio that his train is complete, when the rear vehicle of the train has passed the clearance point in a loop or has cleared the toe of the points on departure from a loop. This is achieved by a coil mounted on the end-of-train marker unit continuously transmitting a high frequency coded pulse at 13KHz.

The pulses are detected by sensors mounted in the track in concrete blocks flush with the top of the sleepers. As the rear of the train passes the first pair of sensors on entering a loop, its direction is noted by a wayside microprocessor. When the second pair of sensors are passed at the clearance point in the

loop, its direction is again checked by the microprocessor and a radio message is broadcast by the 150mw transmitter on the local UHF train radio frequency of 469.700MHz. This transmitter has a maximum range of 2km.

Contained within the broadcast message are location name, direction, train complete and fault messages, if applicable. Fault messages may include such things as low battery voltage on train or defective wayside sensors, etc. If the train stops with its rear vehicle between the toe of the points and the clearance point in the loop, the message 'standing foul' is transmitted, thus indicating that the driver should pull the train forward past the clearance point, at which time a train complete message will be broadcast.

As all unattended crossing loops where this system is installed are fitted with trailable point machines, the TAILS system can monitor the resetting of the points after the train has trailed through them. If the normal position is not achieved within 20 seconds after the rear vehicle has cleared the point blades, the the departure message can be appended with the statement 'points open'. If normal detection is achieved in under 20 seconds then the message will read 'points normal'. Therefore typical messages could be:

**"Inverleigh, down arrival, complete".**

or

**Cressy, up departure, complete, train battery low, points normal".**

The wayside microprocessor selects

the appropriate message from the pre-recorded digitized voice messages stored in the wayside controller.

Apart from the main safety and redundancy checks built into the software, the overall safety in the system is achieved by the fact that, if no message is received, the driver must assume that the train has divided and therefore must stop and examine the train.

Upon receiving an arrival or departure message, the driver relays this via the train to base radio to the train controller, who then clears the track section on his train graph. The overall system therefore not only gives the driver security in the knowledge that his train is complete on exiting the block section, it also enables the train controller to permit a follow on move with complete confidence that the block section is unoccupied. The system has been tested at speeds up to 120km/h.

The wayside electronics and the solar charged battery are housed in

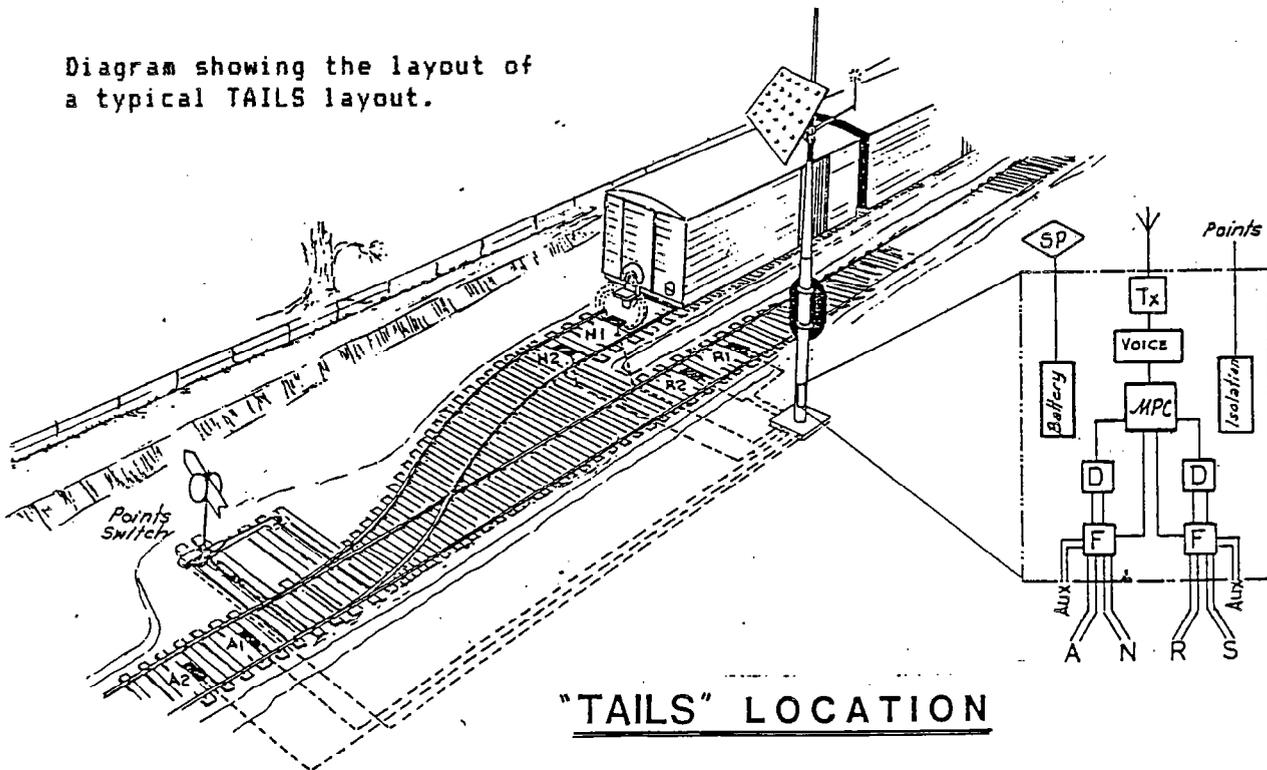
base of a hinged radio mast on top of which is the solar panel, aerial and lightning spike. All wiring is underground from the sensors to the controller mast, hence the only visible item is the mast itself, thus making the installation reasonably vandal proof.

Up to 100 end-of-train movements over the sensors are logged within the microprocessor and then the oldest recording is overwritten. This data can be manually extracted onto a portable printer or transferred to a PC via a modem.

An additional 11 loops are to be equipped early this year on a portion of the Ballart to Mildura line.

With added features, such as separately coded locomotive units, the passage of front and rear of the train can be identified individually. This would form the basis for an electronic train order system whereby authority to proceed could be checked against location. Passing of a sensor without authority would activate the train's brakes automatically.

Diagram showing the layout of a typical TAILS layout.



**"TAILS" LOCATION**

**DATES OF PROVISION OF TAILS IN VICTORIA**

23.3.1989

Ararat-Portland.

23.3.1990

Boort, Charlton.