

SIGNALLING RECORD SOCIETY (VICTORIA)

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Deadline for May 1989 issue is 16 April 1989.  
NEXT MEETING: Friday, 17 March 1989.  
VENUE: A.R.H.S. Library Room, Windsor Rly Station.

MINUTES OF FEBRUARY 1989 MEETING

HELD AT: A.R.H.S. Library Room, Windsor Railway Station.

HELD ON: Friday, 17 February 1989.

MEETING COMMENCED: at 2016 hours.

PRESENT: Jack McLean, Stephen McLean, Roger Jeffries, Keith Lambert,  
David Langley, Andrew McLean, Greg O'Flynn, Colin Rutledge,  
Rod Smith and Rob Weiss.

APOLOGIES: Jim Brough, Glenn Cumming and Alan Jungwirth.

MINUTES OF PREVIOUS MEETING: adopted as read out (Rutledge/Smith)

CORRESPONDENCE: Jack received a parcel from Peter Pay which included a  
Botswana Railways rule book.

TREASURER'S REPORT: Current bank balance is \$2887.95. The Westpac accounts  
operated by Rob Weiss have been closed and all money is  
currently in the State Bank cheque account at Trafalgar. The  
question as to how the editor obtains money was raised;  
already in existence is an account opened when the tenth  
anniversary trip operated.

Motion: "The editor is to use the tenth anniversary account  
to finance Somersault, with regular payments into this  
account by the treasurer. The Trafalgar account will remain  
the Society's general account.

The treasurer is to investigate transferring the bulk of our money into an account which earns significantly higher interest, with the money available at reasonably short notice." (Weiss/Langley)

Motion: "The Society is to pay the A.R.H.S. \$50 as a donation as appreciation of the use of their room for our meetings." (Weiss/McLean)

GENERAL BUSINESS:

1. Books and booklets tabled:
  - (a) Adamstown to Fernleigh" - Brief account of the Adamstown to Belmont railway in N.S.W. and its collieries.
  - (b) Rails through Swamp and Sand" - Story of the Adelaide to Port Adelaide and Outer Harbour line in South Australia.
  - (c) "Spacerail" radio system pamphlet. - a system of modern electronic signalling that might be adopted in Victoria in lieu of the expensive C.A.B.S.
2. Rob Weiss tabled two different Train Order Forms -
  - (a) Chemin de Fer de Provence (France), and
  - (b) Ravenglass and Eskdale (U.K.)
3. Discussion on Train Orders in Victoria. Some points were:-
  - (a) delays to trains reported at South Geelong due to loco crews repeating an order which has already been repeated by the signalman.
  - (b) Victoria seems to have many cases such as Geelong-South Geelong and Bendigo-North Bendigo Jcn where it is useful to overcarry Train Orders. Does any other system do this?
4. Rod Smith described a Pakistan system of issuing Train Orders station to station.
5. Apparently the guard of a six-car electric train change from the third car to some other car at Pakenham. Discussion on rules concerning V/Line trains on Met. territory and vice versa. Is there a guard on the Stony Point train now? We think yes. Oddly enough, when the railcar has failed, the Stony Point train (with a guard) runs with two trailers and no van, but Sunbury and Seymour trains (which have no guard) attach the van.
6. Jack was a passenger in a recent up St Albans spark which pulled down the overhead near South Kensington. The train ran for some time after the problem started as the guard in the third car didn't realise that anything was wrong at the back of the train.
7. Successful tests of radio transmission to a FAX machine on the loco have been held near Little River.

8. Rod Smith is to start production of "Rail News Victoria" in September. He asked what was Somersault's policy on Weekly Notice items. (Answer - anything considered of interest to Society members).

Motion: "The Society will help publicise the new magazine and with an exchange of news and information."  
(O'Flynn/Langley)

9. Rod Smith asked how many stations now had large electric staff instruments.
10. The likely future of remaining electric staff lines in Victoria discussed. (Ed. - answer, no future.)

FORMAL MEETING CLOSED: at 2130 hours.

SYLLABUS ITEM: David Langley showed slides taken in N.S.W. The first group, mainly signalling, came from the 1970's and in many cases the signals are still there. The second group from last November recorded the last Mail trains and local trains west of Lithgow and in a sense were more "historic". All slides emphasised some of the differences between Victoria and N.S.W. with its complex mechanical signals, enthusiasm for ground frames, and continuing use of wooden non-airconditioned cars on passenger trains.

--oDo--

#### MINUTES OF MARCH 1988 ANNUAL MEETING

HELD AT: A.R.H.S. Library Room, Windsor Railway Station.

HELD ON: Friday, 18 March 1988.

MEETING COMMENCED: at 2005 hours.

PRESENT: Jack McLean, Stephen McLean, Wilfrid Brook, Jim Brough, Roger Jeffries, Alan Jungwirth, Tony Kociuba, Keith Lambert, Colin Rutledge, John Sinnatt and Andrew Waugh.

APOLOGY: David Langley.

MINUTES OF PREVIOUS MEETING: adopted as read (Jungwirth/Brough)

PRESIDENT'S REPORT: Jack spoke briefly of another successful year for the Society.

SECRETARY'S REPORT: There is still the need for a prospectus to be given to those people enquiring about the Society and its activities.

TREASURER'S REPORT: For the year 1/1/87 to 1/1/88 the Society recorded a profit of \$577.57. If the current favourable production arrangements for Somersault and UK Signalling Record ceased,

subscriptions would have to be raised to \$15 (Vic) and \$22 (Vic and UK) to break even. The surplus which has been retained in reserve will enable subscriptions to be increased gradually should production arrangements become fully commercial in the future.

Following advice from a professional accountant, all payments are now made via a cheque account. This will enable formal audit of the accounts from 1988 onwards. With the cheque account the main working account, the savings account should be replaced by a more profitable form of investment account.

## INCOME

	\$
Balance of account at 1/1/87 .....	1350.61
Membership fees 1987 .....	565.00
Membership fees 1988 (in advance) .....	56.00
Donations .....	155.30
Profit from Showday tour .....	20.00
Bank Interest .....	124.44
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	2271.35
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## EXPENDITURE

	\$
Postage .....	203.82
Photocopying .....	110.00
New filing cabinet .....	15.00
Bank Charges .....	14.35
Balance of account at 31/12/87 .....	1928.35
	<hr/>
	2271.35
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"The treasurer be empowered to investigate a more profitable investment account." (Brough/Rutledge)

"The meeting thanks the treasurer for the work done during the year, and in compiling the report". (Jeffries/Sinnatt)

Subscriptions for 1989 remain unchanged.

## EDITOR'S REPORT:

Although production of Somersault has been unavoidably delayed this year, the February and March issues are now nearing completion.

## TOURS REPORT:

A profit was recorded for the year. This year's tour will be Ararat-Ballarat.

(continued on page 40.)

## SIGNALLING ALTERATIONS

- WN 1/1989 BACCHUS MARSH-BALLAN. Signalling diagram No 30'88 became effective and diagram No 20'87 was cancelled. Diagram issued following alterations at Ballan. (O 1121/88)
- 28.11.1988 BAYSWATER. Signalling diagram No 41'88 (Heathmont-Belgrave) became effective and diagram No 21'88 was cancelled. Dwarf signals Nos 303, 305, 312, 313, 314 and 315, previously placed out of use, were abolished. (O 2703/88)
- WN 1/1989 WODONGA. A wheel crowder was added to the derail on Little Den's siding. (O 1105/88)
- 19.12.1988 ECHUCA-BARNES. The automatic electric staff system was abolished and replaced by the staff and ticket system. (O 1111/88)
- 19.12.1988 WAKOOL was closed as a staff station, the new section becoming Barnes- Moulamein. (O 1111/88)
- WN 1/1989 "H" CLASS LOCOMOTIVES. "H" class locomotives are now permitted to operate over the same lines as "N" class locomotives at a maximum speed of 100km/h.
- 13.1.1989 BALLARAT EAST. The loco road was realigned to pass through No 2 Interlocked gates. Post 6, (lever 17) the down disc along the loco road was relocated 30 metres on the upside of the interlocked gates. New post 6A (lever 29) up disc along loco road was provided 15 metres on the down side of the interlocked gates. The T.R. cabin was relocated to the right hand side of the loco road. Amend diagram No 8'80. (O 1/89)
- WN 2/1989 AN VEHICLES. The vehicles of classes ADDX, AMNX and ADEY, which previously were not permitted to be marshalled as any of the last three on a train, may now be so marshalled. (O 1109/88)
- WN 2/1989 RUTHERGLEN. Commencing forthwith, Rutherglen will be worked by the Secondman of any train on the line. The Secondman will operate the gates and signals as required. (O 4/89)
- WN 2/1989 STRATFORD. The instructions contained in circular O 1076/88 dated 5.12.1988 have been cancelled and the signaller will only be on duty from 0600 til 1625 with meal breaks from 0725 til 0755 and from 1200 til 1300. At other times the signals will remain at proceed and may be operated by the Secondmen of trains as required. (O 1118/88)
- WN 2/1989 WINCHELSEA-COLAC-CAMPERDOWN. The instructions contained in circular O 990/88 dated 9.11.1988 have been cancelled and the signalmen will not be on duty for all trains. Nos 2496 Tuesdays and 2498 Fridays will be Secondman in charge at Winchelsea and Camperdown. The signalman will cease duty after the passage of No 2497 on Mondays and No 2499 on Thursdays. On Saturdays, signalmen will not be on duty for No 8265 at Winchelsea, Colac and Camperdown. (O 1124/88)

- 9.1.1989 SUBURBAN TRAINS. From this date, Guard's on all trains will operate from the leading Centre Motor of six car trains except the refurbished Harris trains. (O 2001/89)
- 10.1.1989 MURCHISON EAST. The up end plunger locked points "C" were relocated 174 metres in the down direction and up home departure signal "B" was relocated to the left hand side of the line. The push buttons located at the level crossing for the operation of post "B" and the flashing lights will remain. The push buttons located at former points "C" were removed. (O 5/89)
- WN 3/1989 NORTH WILLIAMSTOWN-WILLIAMSTOWN. Signalling diagram No 37'88 became effective and diagram No 24'65 was cancelled. The new diagram shows the altered layout at Williamstown. (O 2014/89)
- 9.1.1989 CRIB POINT. The following track alterations were carried out:-
1. No 3 road was realigned and connected to the Naval Base line. The lead from No 2 to No 3 road at the up end was abolished.
  2. Hayes derails were provided at each end of No 2 road and at the down end of No 3 road. The derail in No 3 road is secured by a 4D padlock and the key is attached to the train staff for the section Hastings-Stony Point.
  3. The level crossing protection and the up home signal on the Naval Base line has not been recommissioned. Notice boards have been provided on the Naval Base line indicating where trains must stop prior to being hand signalled over the level crossing.
  4. The up end of the Naval Base triangle remains out of use. (O 2013/89)
- WN 3/1989 WEBB DOCK LINE. Following a recent survey of the line, the following
- | Distance<br>km | Location                               | Protection      |
|----------------|--|-----------------|
| 0.000          | Beginning of Webb Dock line.           | -               |
| 0.648          | "C" Gate.                              | -               |
| 0.706          | Piggott St/Johnson St/Footscray Rd     | Flashing Lights |
| 1.057          | North Wharf Rd with 2 Pedestrian Xings | Flashing Lights |
| 1.646          | Nos 12-14 Gate South Wharf             | Flashing Lights |
| 1.922          | Nos 15-19 Gate South Wharf             | Flashing Lights |
| 2.288          | No 18 Gate South Wharf (O.D. Gate)     | Open            |
| 2.517          | Pedestrian Crossing                    | -               |
| 2.715          | No 21 Gate South Wharf                 | Flashing Lights |
| 3.077          | No 25 Gate South Wharf                 | Open            |
| 3.312          | Nos 27-32 South Wharf Exit             | Flashing Lights |
| 3.867          | Pedestrian Crossing                    | -               |
| 4.131          | Nos 27-32 South Wharf Entrance         | Flashing Lights |
| 4.330          | No 32 South Wharf (O.D. Gate)          | Open            |
| 4.609          | Lorimer St with Pedestrian Crossing    | Flashing Lights |
| 4.805          | S.E.C. Gate                            | Flashing Lights |
| 5.062          | Wharf Road with two Ped. Crossings     | Flashing Lights |
| 5.982          | Pedestrian/Cycle Crossing              | -               |
| 6.616          | Access Road to Marshalling Yard        | Stop Sign       |
| 6.888          | Williamstown Road with Ped. Crossing   | Flashing Lights |
| 7.279          | Mayne Road                             | Stop Sign       |
| 7.335          | Gate to A.N.L. private siding          | -               |
| 7.837          | End of Line                            | -               |

(continued on page 39.)

## LEVEL CROSSING PROTECTION

by John Sinnatt

### 4. WIG-WAG SIGNALS

#### 4.1 HISTORICAL

One outcome of the special attention given by the Railways in the early 1920s to the question of safety at level crossings, as referred to in 2.1, was the introduction of the Wig-wag signal. This device was to be installed at unattended crossings where the view of an approaching train was restricted. An audible warning alone was no longer considered sufficient owing to the increase in motor traffic and the consequent higher surrounding noise level. The Wig-wag consists of a red disc which swings from side to side on the approach of a train; a red light appears in the centre of the disc at the same time, and a gong sounds in synchronism. The length of the approach section was typically 1200 feet (376 m); this would give 20 seconds warning for a train travelling at just over 40 mph (65 km/h).

Table 4.1 lists the locations on Suburban and Outer Suburban (Healesville, Warburton, Stony Point, Mornington) lines where Wig-wags were installed, while Table 4.2 lists those on Country lines. The locations have been taken from the General Appendixes of 1928, 1936, and 1953. Column A shows the Section or Station ((U) for Up end, (D) for Down end), Column B shows the Year of Installation (Financial Year (July to June) from VR Annual Reports where the writer does not know the Calendar Year from Weekly Notices). Column C shows when the Wig-wags were replaced with other facilities, if at all.

Only 32 crossings in all were equipped with Wig-wags, the main reason being that Flashing Lights were introduced as standard in 1932. The first Wig-wag was installed at Amess Street in 1923 (22 Aug), and from the Tables it will be seen that 29 of the total 32 were completed by 1930; the remaining three were to come much later, probably for special reasons. The last Wig-wag was gained by Chanters Road on the Daylesford line as late as 1943 (20 Jan). This was one of the few crossings listed which previously had hand-operated gates, and the late installation of the Wig-wag could be explained if the Gatekeeper (Ganger or Ganger's wife) had to be withdrawn because of war-time staff shortage, and if mains power was not readily available for Flashing Lights. A Wig-wag is designed to work on 10 volts d.c., and the power required can easily be supplied by caustic soda primary cells. The replacement of the Wig-wag at the Princes Highway, Colac, in 1942 (25 Nov), only about eight weeks earlier, may have been effected to provide equipment for Chanters Road.

The first three Wig-wags were of an early type in which the disc was normally latched to one side behind a shield. If the battery ran low the disc dropped into sight and hung vertically as an "Out of Order" indication. A photograph of this early type at Amess Street appears in the *Victorian Railways Magazine*, October 1924. It may be identified with the "Union Three-Aspect Automatic Flagman", the third aspect being given by the disc swinging as the train approached. The photo shows only one Wig-wag installed at the crossing, and this was the usual practice, but the crossing at Templeton Street, Wangaratta, at least, had two; the second one here looked unusual from a train as it faced along a side street close to the railway.

In the later type of Wig-wag, the disc was normally visible but a separate "Out of Order" sign was latched behind a rectangular shield. The sign dropped not only if the battery ran low but also if the Wig-wag failed to start

when it should have as a train approached. It may have been this positive "Out of Order" indication - something its successor lacks - which led in part to the Railway Commissioners' enthusiastic comment in their 1926/27 Annual Report that the Wig-wag was "undoubtedly the most efficient apparatus of its type yet devised" and that future requirements would be manufactured at the Newport Workshops. The three old-type Wig-wags were replaced and a set of photographs of the new one at Amess Street appears in the *VR Magazine*, August 1926; one of the photos shows the "Out of Order" sign suspended below the stationary disc.

Except for the two crossings at Launching Place, where the line was closed, and the one at Exley Road, where the crossing itself was closed, all the Wig-wags listed in the first Table were replaced by Flashing Lights during the 1936-1970 period, most being in the 1950s or 60s. All in the electrified area that survive today as level crossings have boom barriers. An interesting point is that at nearly every crossing it was at least 50 years before the booms were provided, which tends to underline the point that density of traffic was not the main criterion in selecting the original Wig-wag locations. It was said that the reason for closing the crossing at Exley Road in 1952 (18 Apr) was that impatient motorists who used it to by-pass the gates at Moorabbin, then a notorious bottleneck, were taking too many chances.

In the second Table the grade separations at Euroa, Glenrowan, and Wangaratta, in 1961, and also the boom barriers at Anderson Road shown in the first Table, were associated with the Standard Gauge project. None of the remaining crossings in Table 4.2 are shown as receiving boom barriers, although this Table might be incomplete. The last Wig-wag to be replaced, at Chanters Road in 1974 (14 Feb), was also the last to be provided. A photograph of this Wig-wag with the replacement Flashing Lights in process of installation appears in the *ARHS Divisional Diary*, April 1974.

#### 4.2 MECHANISM

The Wig-wag is operated by two electromagnets or solenoids, each energised alternately by a change-over contact moving with the arm carrying the disc; the gong is sounded mechanically at the same time. Power at about 10 volts d.c. is required, and may be supplied by primary cells; a typical installation might consist of 16x1.2 volt cells connected in series-parallel. Alternatively, trickle-charged secondary batteries may be used. Control of the Wig-wag may be by treadle or by track circuit; these methods are described in 4.3. A Test Switch is provided for checking that the mechanism works correctly.

The arrangements for controlling the "Out of Order" sign add an element of technological sophistication to a fundamentally simple device. The sign is retained in position behind the screen by a normally-energised holding coil. While the approach sections are clear, battery is connected direct to a relay controlling the coil, and the sign is thus held up so long as the battery volts do not fall too low. In the final design, when an approach section is occupied the lead from the battery is taken instead to the Wig-wag mechanism, with the current passing through the primary winding of a transformer connected in series. The pulses of d.c. flowing through this winding as the two operating coils are alternately energised induce an a.c. in the secondary winding; this a.c. is rectified and connected to the slow-releasing holding coil relay, in place of the direct battery. Thus if the Wig-wag fails to start when intended, or if it starts and then stops while the train is still approaching, the holding coil will be deprived of current and release the "Out of Order" sign, which then drops into view. When the sign drops it breaks a contact in the Wig-wag circuit, and so remains down, and the disc remains steady, until the fault is fixed by the Electrical Fitter, who then manually restores the sign.



TABLE 4.1: WIG-WAG SIGNALS (SUBURBAN AND OUTER SUBURBAN)

	A	B	C	D
Anderson Road	Sunsh - Albion	27-26 Jan	F36, B61	Discs for Thro' Sdg
Bakers Road	Batman - Merl	26-24 Feb	F59, B82	-
Amess Street	NCarl - NFitz	23-27 Aug	F44, C65, C81	-
Lower Plenty Rd	Rosanna (D)	25/26 *	F58, B72	-
Grimshaw Road	Wats - Greens	26- 1 Mar	F59, G77	-
William Street	Wats - Greens	25- 4 Jun	F59, X77	-
Rooks Road	Nuna - Mitch	27-12 Aug	F56, B79	-
Mitcham Road	Mitcham (D)	25-12 May	F53, B79	-
Bedford Road	Ring - Heath	25-28 Oct	F62, B82	-
Dublin Road	Ring East (U)	29- 5 Mar	F62, B84	-
Main Street	Croydon (D)	28- 1 Jun	F57, B79	-
Warburton Road	Launching (U)	26-11 Jun	C65	US
Warburton Road	Place (D)	24-23 Dec	C65	DS
Yarra Glen Road	Yarra Glen (D)	27-27 Apr	F70, C83	DS
Exley Road	Moorab - High	27-28 Jul	X52	-
Station Street	Mordi - Aspen	26-31 Mar	F65, B83	-
Nepean Highway	Mooro - Morn	24-29 Jul	F43, C83	-
Hastings Road	Baxt - Somer	24-27 Sep	F62	-

TABLE 4.2: WIG-WAG SIGNALS (COUNTRY)

	A	B	C	
Princes Highway	Colac (U)	24-14 Nov	F42	Column Headings:
Church Street	Colac (U)	24-14 Nov	F71	
Chanters Road	Tyld - FernH	43-20 Jan	F74, C78	A: Section or Sta'n
Rowe Street	Castl - MaldJ	27-21 Jun	F58	B: Year Installed
Anderson Street	Euroa (U)	27-29 Jun	G61	C: Later Changes
Beaconsfield St	Glenrowan (U)	41-17 Jul	F58, G61	D: Signals provided
Hume Highway	Glenro - Wang	26-21 May	F41, G61	Column C Codes:
Roy Street	Wangaratta (U)	36-13 Aug	G61	
Rowan Street	Wangaratta (D)	29-16 Oct	G61	B: Boom Barriers
Templeton Street	Wangaratta (D)	29-16 Oct	F61, X61	C: Line Closed
Beechworth Road	Woorra - Yack	25/26 *	C54	F: Flashing Lights
Ovens Highway	Gaps - Myrtle	25/26 *	F50, X69	G: Grade Separation
Bena - Koru Rd	Bena - White	28-19 Jan	F69	O: Open Crossing
Warragul Road	Korumburra (U)	30-31 Jul	F70	X: Crossing Closed

\*: Exact date not known

#### 4.3 TRACK CONTROLS

The presence of a train can be detected by either treadles ("rail contacts") or track circuits; available evidence suggests that treadles were generally used unless the line was already, or was to be, track circuited. Thus, looking at Table 4.2, the Wig-wag at Rowe Street, Castlemaine, was placed in service soon after the remote control of Maldon Junction, and is known to have been controlled by track circuits. It might also be expected that Wig-wags at the track-locked stations on the North-Eastern line, were controlled by track circuit. In Table 4.1, it is known that the Wig-wags at Bakers Road, Lower Plenty Road, Bedford Road, and Dublin Road (all single track), and Exley Road and Station Street (both double track), were controlled by treadles. It is not known which, if any, were controlled by track circuit, but Amess Street might have been as Weekly Notice 37/23 stated that the disc would swing until the train was clear of the crossing, a feature difficult to achieve with treadles.

The arrangement of treadles on a single track line is shown in Figure 4.1(a). T1 and T3 are effective only for a train travelling in the direction of the arrowhead; these treadles switch on the Wig-wag, and T2 switches it off. The secret of operation lies in the design of the directional "Fusticlo" treadles, which the writer has no information about, but this means that the electrical circuit can be very simple. A normally-operated stick relay is picked up by a make contact on T2, and held up through its own contact and break contacts on T1 and T3 in series. The stick relay while up feeds battery to the holding coil relay, and while down feeds it to the mechanism via a transformer as described in 4.2.

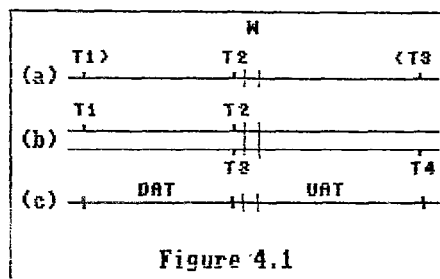


Figure 4.1

An objection to the arrangement illustrated is that the Wig-wag stops as soon as the front of a train moving to the right reaches the crossing, and as soon as the front of one to the left has passed over. In the 1920s it may have been thought good enough to give warning only of the approach, on the assumption that a train actually on the crossing would be seen by the motorist. Another objection, not so obvious, is that the rail at T2 might not deflect enough for the treadle to make its bottom contact. This would be why the Wig-wag at Dublin Road didn't stop after a train went through, as observed by member Roger Jefferies one day about 40 years ago. In fact, the Wig-wags there and at Bedford Road were repeated by bells in the Box at Ringwood, and the signaller could press a button to reset the stick relay at the crossing if he considered that the bell had been ringing for too long.

The arrangement of treadles on a double track line, shown in Figure 4.2(b), is similar to that on single track, and suffers from the same objections. A separate stick relay is naturally required for each track; if both stick relays are up, current is fed direct to the holding coil relay, but if either one is down it is fed to the mechanism through the transformer.

Figure 4.1(c) shows the arrangement of two track circuits for controlling a Wig-wag on single line, with insulated joints on one side of the crossing. This gives better protection than treadles, as the Wig-wag will operate until the rear of the train passes the joints. To achieve directional discrimination an Interlocked Relay is used; this consists of the two track relays DATR and UATR mounted together, with their armatures interlocked. For a train moving to the right, the armature of DATR, when dropping to make its bottom contact to start the Wig-wag, actuates a mechanical device that prevents the armature of UATR, when de-energised, from dropping far enough to make its bottom contact. The armature remains this way when DATR picks up until UATR is again energised, so that the Wig-wag stops as soon as the rear of the train leaves DAT.

A simplistic explanation of the mechanical device is that it resembles a Y-shaped piece, pivoted where the arms meet, and weighted at the bottom so as to be normally vertical. When the DATR armature drops it pushes down the left-hand arm and thus raises the right-hand arm to prevent the UATR armature from dropping right down. A notch in the arm holds the UATR armature, and the Y-piece, in place until UATR picks up; the Y then returns to normal by gravity.

An unusual trick has to be used with an Interlocked Relay to ensure that the "Out of Order" sign works correctly. Because of the contact arrangement, current has to be supplied direct to the holding coil relay when either DATR or UATR is up, whereas it should be only when both are up. To correct this, when DATR drops a bottom contact places a short circuit across UATR, causing it to drop also (but not all the way). This ensures that the holding coil relay is then fed only through the transformer circuit.

#### 4.4 SIGNAL CONTROLS

A signal which exists on the approach side of a crossing usually has to be at Proceed before the Wig-wag will operate. Where a platform at which a train may stop exists along the approach section, or where a shunting movement may take place along the approach without intending to continue over the crossing, a signal may be specially provided to prevent the Wig-wag from operating unnecessarily. Such signals are shown in Table 4.1, Column D (DS = Down Starting, US = Up Starting). The Discs on the through siding, worked by quadrant levers near the posts, were replaced by push-button controlled Dwarf (Light) signals when the booms were installed; the Semaphore at Yarra Glen was replaced by a Light signal when the F/Ls were installed. Existing signals in similar positions at other crossings listed would also control the Wig-wag.

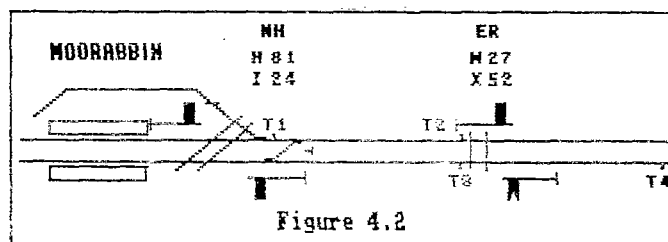
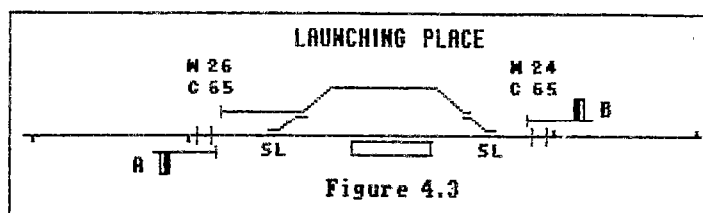


Figure 4.2

Figure 4.2 shows the Down end of Moorabbin station during the period from 1928, when the Wig-wag was provided at Exley Road (ER), until 1952 when the Wig-wag and crossing were abolished. An Up train passing over T4 and then T3 caused the controlling stick relay to drop and then pick up, and so started and stopped the Wig-wag in the usual way. A Down train or shunt passing over T1 also dropped its stick relay, but if the Starting signal was at Stop the Wig-wag remained stationary, and did not start until the signal was lowered. For a shunt which did not ever pass over T2, reversal of the lever working the Ground Disc completed an alternative path to re-set the stick relay. An irrelevant but interesting detail is that the Point Indicator (not shown) attached to the deraill in the siding behind the platform was, unusually, mounted on a post.

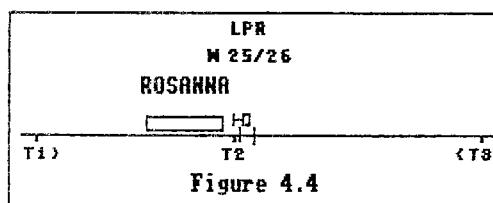
Figure 4.3 shows Launching Place from the time it gained its Wig-wags in the 1924-26 period until the Warburton line was closed in 1965. It had no Arrival Home signals, not being a Staff station, but a Starting signal had to be specially provided at each crossing so that its Wig-wag would not operate unnecessarily during a platform stop or other station work. This made its signalling arrangements unique in Victoria, at least in the Semaphore era. Its uniqueness was enhanced by both signals being fitted with reversers. Detailed instructions were given in the General Appendix; these allowed the Caretaker as well as the Guard to work the levers.

The writer does not know whether the Wig-wags here were controlled by treadles or track circuits, and so the Figure is somewhat ambiguous. The GA admittedly refers to "track circuits" but in this context that should not rule out treadles. It is however reasonably clear that there were no approach sections on the platform side of the crossings, and that the Wig-wag would start when the signal was lowered, whether a train was there or not.



If treadles were in fact used, then starting from the left, the two marks show where T1 and T2 would be, and a normally-made contact on the signal arm would correspond to T3. For a Down train things would work as usual, but for an Up the Wig-wag would start when signal A was lowered. The reverser would be normally energised, but the passage of the train over T2 would cause a contact in its circuit to break, and so the signal would go back to Stop. Similar arrangements would apply at the other crossing. It would also be possible to devise a system with a single track circuit (extending between the marks) controlling the DATR coil of the Interlocked Relay, and with the signal arm contact controlling the UATR.

The final example, Figure 4.4, is included to show how the Railways were able to cope with the equivalent of a shunting movement without benefit of a signal at the crossing, but at the expense of motorists' time. Rosanna was not a Staff station but a number of trains terminated there - four daily in 1938 and eight in 1945. For a terminating train the Wig-wag was started as usual when the front passed T1, and was stopped when the Driver, after the passengers had alighted, took the train forward to the Limit of Shunt board just beyond T2. The motorists could then proceed after waiting for a train that didn't cross, while the Driver set back into the platform.



The writer, on observing this procedure one day in 1948 or 1949, was reminded of Aesop's fable about the boy who cried "Wolf!", but fortunately the inevitable accident doesn't seem to have happened. The motorists' down time was somewhat reduced when the treadles were replaced by track circuits around 1950. Then, as soon as the local train stopped in the platform, the Driver went to a box on the end fence and turned his key in a switch lock to stop the Wig-wag.

Everything changed in 1958 (14 Dec). The line was duplicated through to Macleod and all trains continued on, three-position signalling was installed, and the Wig-wag was replaced by Flashing Lights.

(The writer thanks members Colin Rutledge for supplying information on the Wig-wag mechanism and "Out of Order" sign, and on treadle control on double lines; Alan Jungwirth for filling in gaps in the first draft of Table 4.2 and Keith Lambert for checking dates; and Roger Jefferies for suggesting long ago that the writer should go to Rosanna to see a terminating train arrive.)

(End of Part 4)

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V.R. SIGNALLING HISTORY No 44.MACAULAY and ARDEN STREET

by Andrew Waugh.

When the single line was opened to Coburg on Tuesday, 9 September 1884, there were no stations between North Melbourne and Royal Park. Both Arden Street and Macaulay Road were only level crossings, equipped with four 13' 6" gates but not, apparently, with cottages for the gatekeepers.

The single line climbing the 1 in 50 grade between Macaulay Road and Royal Park was sufficient for the service to Coburg but it must have been clear that it would never cope with the expected traffic from the proposed branches to Somerton, Whittlesea, Fitzroy, Collingwood and Heidelberg, authorised in the Octopus Act of 1884. Accordingly, it was decided to duplicate the Coburg line from the junction at North Melbourne to Royal Park.

Duplication was commenced from North Melbourne and on 19 December 1886, the section to Macaulay Road was brought into use. On this date, an eight lever interlocking frame (no spaces) was provided and block instruments were probably introduced to the Coburg line. Certainly the single line between the junction and Royal Park lacked this refinement in December 1885, but by 19 January 1887, Macaulay Road was working block with both Coburg Junction (North Melbourne) and Royal Park. The section to Royal Park was, of course, worked in conjunction with staff and ticket. The end of the double line was known as "Macaulay Road Junction".

Apparently in conjunction with the duplication, gatekeeper's cottages were constructed at both Arden Street and Macaulay Road by a W. Blackwood. His tender of £418-13-2 was accepted on 30 April 1886 although he eventually only claimed £412-5-9.

Macaulay Road was opened for passengers from 1 December 1887. In preparation for the opening, a contract was awarded to a Jackson and Co. on 12 August 1887 to construct a platform and station buildings at Macaulay Road. The tender price was £689-3-1 but they managed to build it for only £635-14-0.

The track layout of Macaulay Road prior to 1890 is not known. The one line description of the contract for the passenger station implies that only one platform was to be constructed (probably the future up platform). This would suggest that the end of the double line was on the Melbourne side of the platform, probably near the gates, which is also the position suggested by the principle of least cost and effort. The eight lever frame suggest a set of points, a lockbar and six signals, so the layout of Macaulay Road could have been similar to Figure 1. With "modern" block working rules it would be desirable to have a down outer home arrival signal to allow the acceptance of both up and down trains at the same time, however, the block working rules were somewhat laxer at this stage.

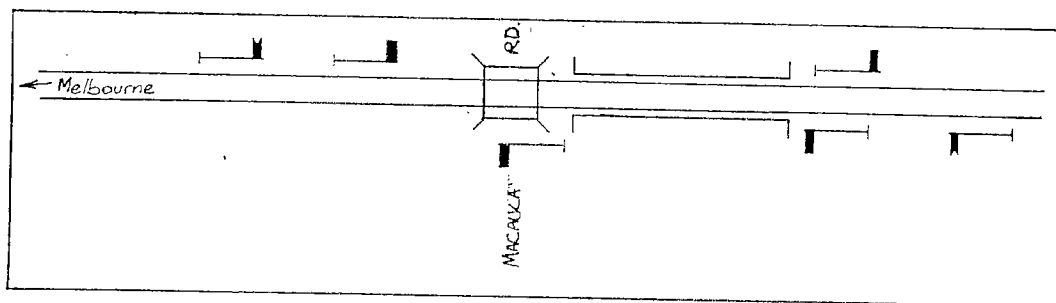


Figure 1. MACAULAY ROAD - 1886-1890 (suggested layout)

The branch lines from Royal Park to Heidelberg, Collingwood and Fitzroy were opened on 8 May 1888, nearly four months before the duplication from Macaulay Road to Royal Park was in use. The timetable introduced for the opening shows that 114 trains passed over the single line section to Royal Park every day. This meant that there was a train between Macaulay Road and Royal Park for roughly 9.5 hours out of every 20. Given the 106 foot climb in one and a half miles, the stop on the 1 in 50 grade at Flemington Bridge, the fairly inflexible safe working system, and the poor recovery margins allowed, it was unsurprising that the timetable was revised less than one month later with roughly 25% fewer trains every day.

The duplication was finally opened through to Langridge Street (North Carlton) on 2 September 1888. The frame at Macaulay Road was moved to Langridge Street to control the new end of double line. Since there is no alteration to the timetable at this time, Macaulay Road probably remained a block post working double line block with Coburg Junction and Royal Park. These were the block sections in the August 1890 timetable, just before interlocking was re-introduced at Macaulay. The necessary signals in each direction were probably worked by pull over levers on the platforms and the layout was probably something similar to that shown in the bottom diagram of Figure 1, perhaps with the addition of a hand worked crossover.

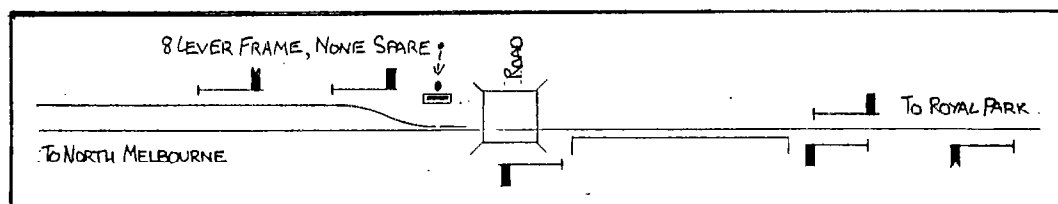


Figure 2. MACAULAY ROAD - 1888-1890 (suggested layout)

Extensive alterations to Macaulay Road took place on 29 October 1890 when the goods lines were provided between Macaulay Road and North Melbourne. This involved the provision of a new signal box containing a 30 lever frame which controlled the double line junction, signals and gates. The original McKenzie and Holland locking sketch has survived and is the basis of the layout shown in Figure 3.

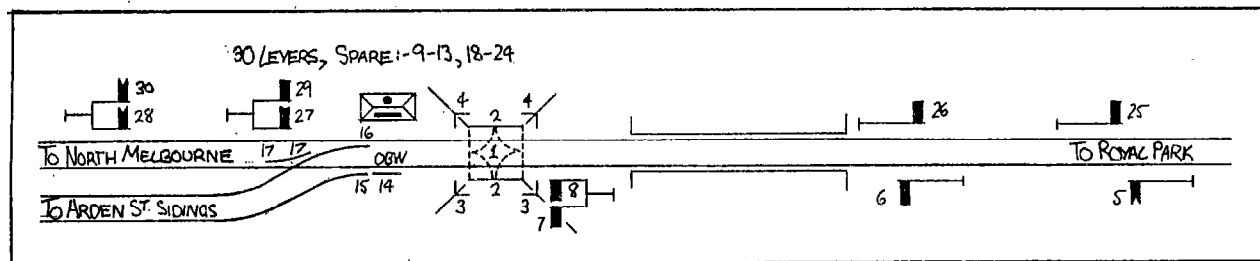


Figure 3. MACAULAY ROAD - 1890-1891.

The goods lines were apparently treated as up and down running lines - note the lack of catch points, the lay of 17 points in the crossover and the provision of a down distant for the goods lines. However, the method of working the goods lines at this stage is unknown. An oddity was the provision of a down advanced starting signal. Usually these are situated in advance of points but

this is not the case here (at least for some months). It is possible that this signal was provided so that a down train could draw forward waiting line Clear from Royal Park sufficiently far so as to allow Macaulay Road to give line Clear to Coburg Junction for the next train.

Unfortunately, there is no reference to the installation of the required connection to the goods lines at Coburg Junction (North Melbourne) in the interlocking register. The last alteration in this signal box was in 1898 when there were five spaces in the frame. There were still five spaces in the frame when the new register was started in 1899. Apart from several omissions or errors in the register, the most likely explanation for this anomaly is that the lead to the goods lines replaced an existing siding.

Less than three months later, on 15 January 1891, the layout at Macaulay Road was slightly re-arranged. The new track layout is shown in Figure 4. Catch points in the goods lines were provided together with a new crossover at the

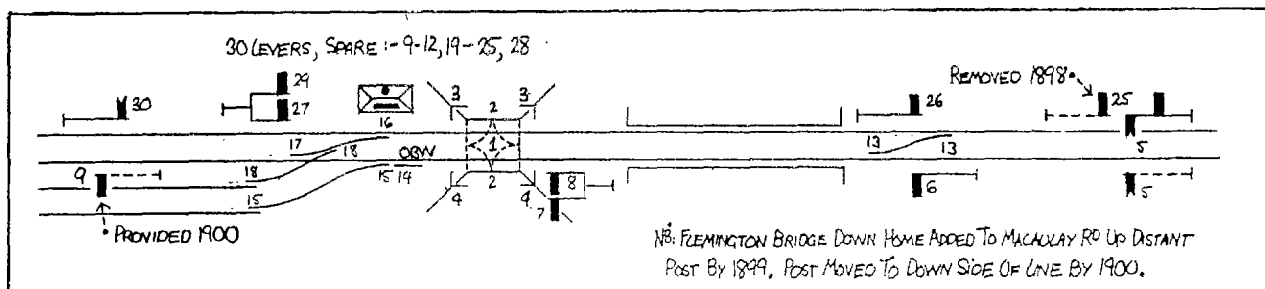


Figure 4. MACAULAY - 1891-1906.

down end of the yard. The down distant for the goods lines appears to have been abolished at this time and the lay of the points 17 & 18 was probably altered also. Why catch points were not provided initially is somewhat of a mystery. Perhaps an unfortunate incident prompted their installation! The new crossover was probably provided to allow down goods trains, stalled on the bank between Macaulay Road and Royal Park, access to the goods sidings. Certainly, the General Appendices published this century have prohibited stalled goods trains from dividing on the bank, the train crew had to obtain a wrong line order from Macaulay Road and then set back into the Arden Street sidings.

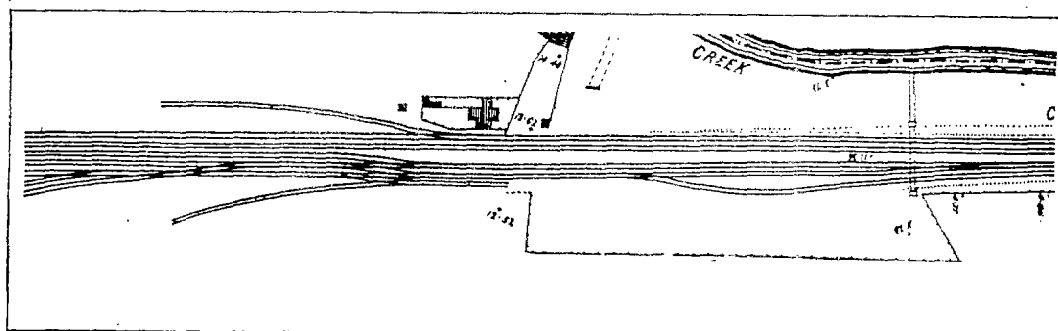


Figure 5. ARDEN-STREET - mid 1890's

Figure 3 is taken from a 160' to the inch M.M.B.W. plan showing Arden Street level crossing which was probably surveyed in 1854 or 1875. There are several interesting features of this diagram. The first is the short siding trailing into the down Coburg line behind the gatehouse. This might have been a

short private siding but it also might have been a set of runaway points to avoid the inconvenience of a runaway spreading itself all over North Melbourne Junction. Next, note the nest of crossovers in the goods lines just south of the gates. The layout of the tracks suggests that even at this early date the goods lines were single from North Melbourne to the Arden Street gates where the major shunting neck for the sidings was located. Trains working north of Arden Street did so on a two track section with left hand running - note the unusual trailing crossover to the north of the level crossing which may have formed a head shunt.

Turning back to Macaulay Road, the down advanced starting signal No 25 was removed on 27 July 1898. This may have been in conjunction with the provision of the down home for Flemington Bridge on the post which held the Macaulay Road up distant, or the removal of this post to the down side of the line. Although there is nothing to suppose these three events occurred at the same time, they had certainly taken place before 1900, and the down home had been combined with the up distant before January 1899. Royal Park Spoil Siding was opened as a block post on 7 August 1899 with a six lever frame (there was one space) and switching instruments. The spoil siding was provided to obtain filling from the cuttings for the Melbourne Yard gravitation scheme, and possibly the Princes Bridge to Victoria Park line. Only one up train was allowed between Royal Park and Macaulay Road, even when the spoil siding box was open, but the spoil siding box could divide the Macaulay Road to Royal Park section in the other direction, allowing two down trains to climb the bank at once. The frame was removed on 9 October 1899 although it appears that some signals and the block instruments may have survived (it was closed permanently as a block post in 1912). There is no indication that it ever regularly switched in as a block post, it does not appear in any of the lists of block posts in the surviving working timetables for example.

The new century brought some minor changes. Macaulay Road gained a new up advanced starting signal on post 10 (almost certainly worked by lever 9) on 23 April 1900 and from the end of April (according to WN 44/1900) the signalman at Macaulay Road could accept an up train from Royal Park under the "Warning" rule, that is, if the section was clear only to the home signal.

The junction at Macaulay Road with the Arden Street sidings was simplified on 20 March 1905 although this was not apparently recorded in the Weekly Notices. The connection from the down goods line to the down main line and the associated crossover was removed, and the down goods line connected to the up goods line by a set of hand points behind catch 15. Presumably, it was at this time that the bracket post carrying the two down homes (Nos 27 and 29) was replaced by two separate posts, one carrying the down main line home and the other the

disc leading from the Arden Street sidings. It is interesting to note that this disc applied all the way applied all the way through the up platform, over crossover 13 and into the next section. The probable resulting layout is shown in Figure 6.

Early next year (16 March 1906) the signal box was abolished and replaced by a new combined ticket office and signal bay on the up platform diagonally opposite the former signal box. The new frame had only 18 levers, although the number (and distribution) of working levers remained the same. Presumably this was to reduce staff numbers, particularly at slack times, although the signalman must have had a hard time watching his signals and

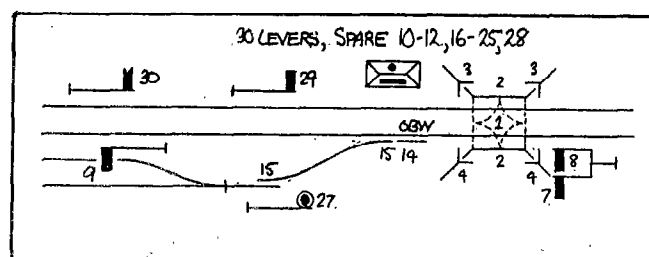


Figure 6. MACAULAY (UP END) 1905-1906  
(suggested layout)



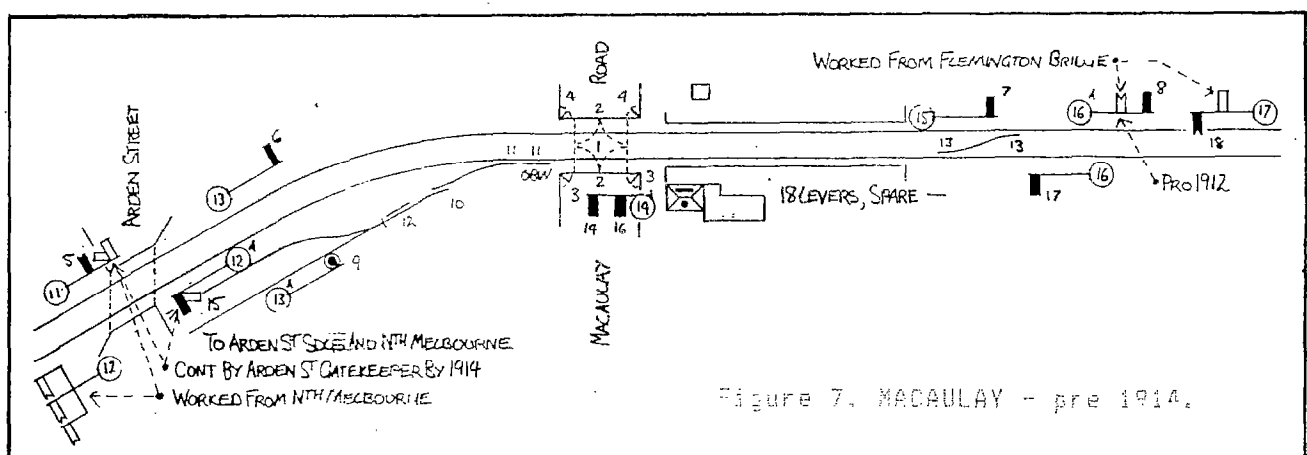
passing trains from his new post on the inside of a sharp curve. The new station building must have also made sighting of the starting signals at the end of the up platform difficult because bracket post 14 was replaced with a straight post with two arms towards the end of July 1914 (WN 30/06).

The General Appendix of 1908 includes instructions for working the goods lines. The signalman at Macaulay Road was required to turn up goods lines into the sidings if North Melbourne could not accept them on the same line. If a train was already in the sidings the second train had to be stopped and cautioned, but if the sidings were free then the train could proceed straight in, although the signalman had to delay pulling off No 14 home signal until the speed of the train had been reduced to 8 mph. Down goods trains were a little more restricted. North Melbourne could not send a down goods train into the siding until he had obtained permission from Macaulay Road and the signalman at Macaulay Road could only give his permission if there was no train in the siding or about to enter.

From 1 May 1909 Macaulay Road was known simply as Macaulay.

Royal Park Spoil Siding was finally permanently closed as a block post in late January 1912 (WN 4/12). Roughly three months later, on 6 May 1912, Flemington Bridge station was opened as a block post with switching facilities. This must have been done with some degree of urgency as Flemington Bridge at this stage had only a single home in each direction. The down advanced starting signal post 16A at Macaulay was reinstated in May, and this post gained Flemington Bridge's down distant on 28 July 1913 when Flemington Bridge was provided with a frame and the usual complement of signals.

Post 13A, which governed movements from Arden Street Sidings across the level crossing, was moved 50 yards further from the level crossing on 2 September 1912 (WN 36/12). This was presumably in conjunction with the provision of a plunger and lockbar on the hand points joining the up and down goods lines in front of post 13A. This lockbar had certainly been provided by the time signalling diagram No 27/13 had been issued. This diagram is the basis for the layout shown in Figure 7. Macaulay had a penchant for collecting lockbars and



plungers in unusual places. Lockbars on hand points were fairly uncommon; Newport Workshops No 1 Box has several, and the Flemington Racecourse line had a few plungers. The plunger itself, according to the 1948 locking sketch, ensured that, before signal 14 could be pulled off for an up goods, the hand points were

According to the 1913 Book of Signals, the Gatekeeper at Arden Street had been given control of both, North Melbourne's down starting signal and Macaulay's up starting signal, to protect his gates. This, however, is not shown on diagram 27'13 (which does not even show the hand gates in any case).

In 1914, the first goods siding was brought into use. The siding, Wolskel's siding, trailed into the up main line between post 16 and the up platform. Augustus Wolskel was a technical chemist associated with (probably owning) the Heathcote Chemical Coy. Pty. Ltd., under which name the siding would later become known. The first step in the provision of the siding was the movement of post 16 some 35 yards further out from the platform in the middle of September 1914 (WN 38/14). Weekly Notice 40 of the same year notified that Wolskel's siding was sufficiently advanced to allow access by ballast trains. The points in the main line were worked from a hand lever, totally free of any interlocking, and the protection of main line trains from movements from the siding was provided by a scotch block secured by a padlock. As the signalman had no means of preventing the ballast trains from sunting outside the up home signal, the signalman at Macaulay had to "block back" to Royal Park (or Flemington Bridge) before shunting commenced and could not give obstruction removed until the scotch block was padlocked across the siding and the key was in his possession.

These instructions lasted until the permanent signalling was provided in the middle of October 1914 (WN 42/14), the down end of the station is shown in Figure 8 which is based on signalling diagram 15'16. The delay was caused by the lack of spaces in the frame; five levers had to be added to the right hand end. Opportunity was also taken to fit a plunger and lockbar to the up end of No 13 crossover. It was probably provided as the view of a departing down goods from the signal bay would have been fairly poor and there would have been the possibility of No 13 crossover being restored before the goods was clear on the down line, so as to be able to give line clear to Royal Park. A poor sense of timing could have split the goods train.

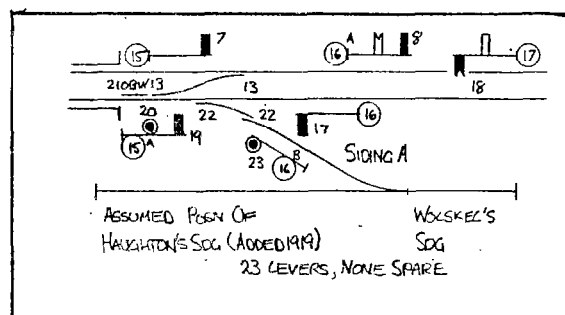


Figure 8. MACAULAY (DOWN END)  
1914-1923.

The second private siding at Macaulay, Haughton's siding, was provided in April 1919 (WN 14/19). It is assumed that it trailed off the existing siding as shown on the inset in Figure 4. Haughton William and Coy. were wool and skin buying brokers who supposedly opened a Mark Street (adjacent to the station) office in 1919, although no mention of this office is made in Sands and McDougal's directories. However, the Victorian Producers Co-op's wool store was listed from 1920, so it is reasonable to assume that "Haughton's Siding" became the grain store siding. The Heathcote Chemical Coy's siding was transferred to a new company, the Phosphate Co-op Coy. of Australia Pty. Ltd., from March 1921 (WN 10/21).

(to be continued)

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SIGNALLING ALTERATIONS  
(continued from page 26)

- 2.2.1989 ECHUCA. Between 0800 hours 1.2.1989 and 1600 hours 2.2.1989 the new Murray River bridge will be brought into service. The flashing lights at the Sturt Street level crossing and the down starting signal "D" will be relocated to the new railway alignment whilst the home signal "U", post 8, will be relocated to a position 67 metres on the down side of the crossing. Healthy state lights are provided at Sturt Street flashing lights. (D 31/89)
- ~~25.1.1989~~ WODONGA COAL SIDINGS. The points leading to the loaded gauge 31 siding were abolished. The switch locks will be disconnected & remain in situ until further notice.
- X 25.1.1989 SEYMOUR. Signalling diagram No 34/88 became effective and diagram No 8/87 was cancelled. The alterations were:-
1. The down line between posts 1 and 2 became a two-way running line - No 1B.
  2. Dwarf signal No 35 was provided at the up end of No 1B road.
  3. A disc signal, lever 36, was provided on post 9 and leads to No 1B road towards post 75.
  4. The dock road, Siding 10, was officially abolished, the siding having been booked out and spiked for about three months.
  5. Levers 35 and 36 were previously sleeved normal. Lever No 28 was sleeved normal. (D 25/89)
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- WN 4/1989 DUNOLLY-COPE COPE. Signalling diagram No 36/88 became effective and diagram No 21/84 was cancelled. The diagram shows the altered layouts at Dunolly and Cope Cope. (D 30/89)
- X 31.1.1989 SEYMOUR "B" BOX. The following alterations were effected:-
1. Down home signal on post 26 (Lever 48) was abolished.
  2. No 27 crossover between Nos 5 and 6 roads was abolished.
  3. Levers Nos 27 and 48 were sleeved normal.
- Amend diagram No 34/88.
- Previously No 21 points, No 22 plunger and disc signals Nos 13 and 14 were abolished. Levers 13, 14 and 21 were sleeved normal. Lever No 22 became a Pilot Lever. (D 34/89)
- 2.2.1989 SWAN HILL. Healthy state lights and yellow whistle posts were provided at the following flashing light equipped level crossings:-
- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| Murray Street         | - Kerang-Lake Boga    | (290.475km)           |
| Murray Valley Highway | - Kerang-Lake Boga    | (294.359km)           |
| Murray Valley Highway | - Lake Boga-Swan Hill | (336.566km)           |
| Bryan Street          | - Swan Hill-Moorabin  | (343.949km)           |
| Gray Street           | - Swan Hill-Moorabin  | (344.417km) (D 37/89) |
- WN 5/1989 QUYEN-PINNAROD LINE. The maximum speed of trains when passing over the facing points at the following stations has been increased from 30km/h to 40km/h when running on the straight road:- Balah, Walpeup, Torrilita, Underbool, Linga, Tutye, Cowangie, Murrayville, Carina and Panitya. (D 36/89)

MINUTES OF 1988 ANNUAL MEETING

(continued from page 24)

## ELECTION:

The President vacated the chair and this portion of the meeting was chaired by Jim Brough. The following nominations were received and as there was only one for each position, the nominated people were duly elected.

Position	Nominee	Nominated	Seconded
President	Jack McLean	Tony Kociuba	Wilfrid Brock
V/President	Alan Jungwirth	Jack McLean	John Sinnatt
Secretary	Stephen McLean	Colin Rutledge	John Sinnatt
Treasurer	Stephen McLean	Alan Jungwirth	Jack McLean

David Langley was reappointed as Editor (Jungwirth/Rutledge)

ANNUAL MEETING CLOSED: at 2036 hours.

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PYALONG

(Reprinted from Weekly Notice No **35** for 1931.)

On 24.7.1931, Pyalong was closed as an Electric Staff station and the section is now Kilmore-Tomborac. The Up and Down Home signals are retained and the points remain plunger locked.

At the Up end, the points from No 2 to 3 road lie for No 3 and are spiked in that position.

The points leading from No 3 road to the dead-end extension at the Up end lie normally for the dead-end and are secured in that position by a Hand Locking Bar and Standard Padlock.

The points in No 4 road at Up end lie normally for the Dead-end extension and are secured in that position by a Brown's Hand Locking Bar and padlock.

At the down end, the points between Nos 2 and 3 roads, normally lie for No 3 road and are secured by Hand Locking Bar and standard padlock.

The points leading from No 2 road at Down end normally lie for dead-end extension and are secured by Hand Locking Bar and padlock.

The points to and from No 3 road and the dead-end extension of No 2 road normally lie for No 3 road and are secured by Brown's Hand Locking Bar and padlock.

A scotch block is provided at the Up end of No 2 road and is securely fixed across the rail.

Scotch blocks are also provided on the dead-end siding at the Up end, at the Up end of No 4 road, on the Down end of Nos 3 and 4 roads, on the dead-end extension of No 2 road, Down end, and on the lead to the Sand Siding.

Notice Boards lettered:- "CAUTION - BEFORE TURNING VEHICLES FROM MAIN LINE TO YARD, LOCKING BAR ON TRAILING END OF CROSSOVER MUST BE FREED" are provided at the Main Line points at each end of the yard. Vehicles must not be permitted to stand in No 2 road after shunting operations are completed.

(A 1317/31)

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