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Deadline for July 1989 issue is 17 June 1989.
NEXT MEETING: Friday, 19 May 1989.
VENUE: A.R.H.S. Library Room, Windsor Rly Station.

MINUTES OF MARCH 1989 MEETING

The Minutes of the March 1989 meeting are not published here through no fault of the secretary. They are somewhere under piles of paper on my desk.

SIGNALLING ARRANGEMENTS

13.2.1989 DUNOLLY-EMU-ST ARNAUD-SUTHERLAND-DONALD. St Arnaud was closed as a staff station and the electric staff system abolished between Dunolly and Donald. Train Staff and Ticket working was introduced on the sections Dunolly-Emu-Sutherland-Donald. The fixed signals at St Arnaud will be fixed at proceed. The signals at Emu and Sutherland were abolished and the plunger locking on the facing points replaced by trailable point machines. At Sutherland the points leading from No 2 road to No 3 road were equipped with non-trailable point machines inlieu of the WSa levers and hand locking bars. Signalmen must be on duty at Emu and Sutherland for all trains until train order working is commenced. (O 47/89)

WN6/1989 WEST FOOTSCRAY. The overhead wiring between the down line and No 1 siding and in the siding has been abolished. (O 2039/89)

14.2.1989 UNDERBOOL was closed as a staff and ticket station, the new section becoming Ouyen-Cowangie. (O 59/89)

15.2.1989 PYRAMID. The up approach track to the Sunraysia level crossing was reduced and a speed board lettered "30KM/H TO CROSSING" was provided 20m on the upside of the platform. Healthy state lights were also provided. (O 77/89)

14.2.1989 WARRNAMBOOL. The following alterations were carried out:-

1. Up outer home signal J, post 8, was abolished.
2. Up home signal H, post 7, was abolished.
3. Down departure home signal E, post 5, was abolished.
4. The A pattern annett lock on the Storage Road and Esso Siding were abolished and the points provided with WSa levers and hand locking bars.
5. The plunger lock at the down end was removed and the points provided with a WSa lever with a hand locking bar. (O 68/89)

15.2.1989 PYRAMID. Circular O 77/89 is cancelled. The the up approach track to the Sunraysia level crossing was reduced and a speed board for up trains, lettered "30KM/H TO CROSSING", was provided 20m on the upside of the platform. Also a further speed board for up trains, lettered "50KM/H", was provided 63m on the down side of the down end points. Healthy state lights were also provided. (O 77/89)

17.2.1989 NORTH BENDIGO JUNCTION-PIANGIL. The Train Order system of safeworking will be introduced on the above section of line. The first train to be issued with a train order will be No 8043 on Friday, 17.2.1989. Boards lettered "COMMENCE TRAIN ORDER WORKING" and END TRAIN ORDER WORKING" will be erected at Bendigo "D" Box and Piangil. At Piangil the boards will be located 300 metres outside the facing points and trains may shunt inside these boards without a Train Order being issued. Trains must not cross at Piangil.
The crossing stations will be Eaglehawk, Dingee, Pyramid, Kerang and Swan Hill. Swan Hill is an Intermediate Terminal Station. At Pyramid and Kerang the secondman will be responsible for clearing the respective departure signals when the station is unattended. At Eaglehawk a qualified employee must be on duty for all trains.
The train order for Swan Hill line trains may be issued to the signalman at Bendigo "B" Box, although it must not be issued if there is an unfulfiled Train Order existing for the sections North Bendigo-Eaglehawk and Eagehawk-Dingee. Prior to handing the Order to a down train, the signalman must ascertain that the signalman at Bendigo "C" Box has obtained Line Clear from Bendigo "D" Box. On Saturdays one signalman is authorised to work both "B" and "C" Boxes and consequently the Train Order is obtained whilst at "B" Box but is delivered to the train when it passes "C" Box.
One Miniature Master Key No 26 and lettered "Bendigo "D" Box Pilot only", and three large Master Keys Nos 27, 28 and 29 lettered "Bendigo "D"-Swan Hill" will be provided. One large key will be normally kept at Swan Hill and the remainder at North Bendigo "D" Box. (O 52/89)

21.2.1989 WATCHEM. The signals, signal quadrants and plunger locks were abolished. The main line points were fitted with trailable point machines and down trains will now normally travel via No 2 road. Non-trailable point machines were provided on the points leading to No 3 road. These machines are rodded to derail & wheel crowder at the down end points, and to safety points at the up end. Location

21.2.1989 BAXTER was closed as an electric staff station. The new section became Frankston-Somerville. A composite staff is provided for the new section. The main line points have been secured normal and locked with an BP padlock. All signals have been secured reverse and the flashing ligts have been altered to work automatically for all trains. The push buttons for the down home departure signals and manual operation of the flashing lights have been removed. (O 2060/89)

26.2.1989 TOTTENHAM YARD. The compound hand points and single ended hand points leading from the 1st Classification Yard and Repair Siding to the down goods line were connected to a Miniature Annett Key apparatus? The normal position of the points will be to lay away from the down goods line. The key is normally kept in the signal control panel and when removed will secure the signal on post 3G at the Stop position. The key is to be handed to the shunter in charge and he will operate the annett locked points as required. Amend diagram No 1'86 accordingly. (O 116/89)

27.2.1989 LONG ISLAND JUNCTION. A new Master Key lettered "SOMERVILLE - FOR USE AT LONG ISLAND JUNCTION" has been provided and a signalman will be in attendance at Long Island Junction to signal certain trains to and from the branch line as arranged by the SM Somerville. The respective trains are to be advised via the End to End radio if a signalman will be at the junction.

If no signalman is in attendance the secondman of trains proceeding to or from the Long Island line will perform the safeworking duties. If a signalman is in attendance, he will perform the safeworking duties as follows:-

1. A down train must be stopped at the junction and the Somerville-Hastings staff obtained from the driver and used to unlock the points.
2. After the train has cleared the safety points, the signalman must complete the safeworking duties as prescribed in the rules for an Intermediate Staff Instrument.
3. For an up train from the Long Island line, the signalman must obtain the Somerville-Hastings staff from the Intermediate Staff Instrument.
4. Then the points may be unlocked with the MASTER KEY and the home signal cleared for the passage of the train.
5. As the train passes the junction, the electric staff is to be handed to the driver.
6. After the train has cleared the junction points, the safeworking duties must be completed by the signalman.

In the event of Pilotman working being established due to failure of the electric staff instruments, the Master Key must be carried by the Pilotman unless required to operate the junction points when it is to be handed to the signalman at the junction. (O 114/89)

28.2.1989 KERANG. The light signals on posts 7 and 8 were converted to non-track cancelled signals. (O 107/89)

28.2.1989 SOUTH KENSINGTON. A co-acting signal was provided to work in conjunction with down home signal post 24 and is located on the right hand side of the line. Amend diagram No 35'87. (O 2079/89)

WN8/1989 CAMPERDOWN. All light signals have been converted to non-track cancelled signals. (O 88/89)

WN8/1989 ARARAT-WOLSELEY. The Train to Base radio will operate on Channel 6 inlieu of Channel 2. (O 96/89)
(Channel 6 is also used for standard gauge trains but as land lines link the repeaters with Train Control there is no danger that a standard gauge train would be picked up by a repeater between Ararat and Wolseley. This also reserves Channel 2 exclusively for Melbourne to Ararat.-DEL)

WN8/1989 SOUTH GEELONG. Siding B and No 1 goods siding have been disconnected from the main line at the down end and the portion of siding through the Swanston St level crossing has been removed. Baulks are provided on the sidings on the Geelong side of the level crossing. (O 86/89)

WN8/1989 WINCHELSEA. When the station is attended the up and down light signals will be worked by 5P key switches. When the station is unattended the signals will be approach operated when the train departs the platform. 12 seconds of flashing light operation will precede the clearing of the signal. Speed boards lettered "10KM/H TO CROSSING" for up trains and "40KM/H TO CROSSING" for down trains have been erected. (O 89/98)

WN8/1989 HEYWOOD. Light signal A has been converted to a non-track cancelled signal. (O 100/89)

WN8/1989 MAROONA. Light home signals A and D have been converted to non-track controlled signals. (O 101/89)

x 1.3.1989 SEYMOUR. Signalling diagram No 2'89 will become effective and diagram No 34'88 will be cancelled. The alterations will be:-

SEYMOUR A BOX

1. Ground disc signal post 11 leading from No 3A road to No 3 road, and ground disc signals post 14 leading from No 3 road to Nos 2A or 3A roads, will be abolished.
2. No 48 crossover will be spiked normal and removed later.
3. Nos 15, 16 and 17 points will be converted to hand operation with WSa levers.
4. Levers Nos 15, 16, 17, 43, 48, 49 and 50 will be sleeved normal.

SEYMOUR B BOX

1. The disc signals on post 23 from "Y" and ground disc No 25 from "X" will be abolished.
2. The disc signal on post 19 and the bottom right hand disc on post 27 will be abolished.
3. Post 28, one arm and one disc, will be abolished.
4. No 32, 33 and 36 plungers will be abolished, Nos 33 and 36 becoming pilot levers.
5. No 30, 31, 34 and 35 points (i.e. the two double compounds outside B Box) will be abolished.
6. No 38 compound points will be converted to a turnout.
7. No 26, 28 and 29 points will be converted to hand operation with WSa levers.
8. Levers Nos 17, 26, 28, 29, 30, 31, 32, 34, 35, 41, 42, 43, 63, 65, 69 and 76 will be sleeved normal. (O 95/89)

2.3.1989 CARWARP. Between Monday, 27.2.1989 and Thursday, 2.3.1989, the fixed signals and plunger locking will be abolished and trailable point machines provided on the main line points. The points leading to No 3 road have been equipped with non-trailable point machines rodded to safety points in No 3 road. Location boards were provided and down trains will travel via No 2 road. (O 105/89)

2.3.1989 STRATFORD. The following alterations were carried out:-
1. Up home signal post 2 was converted to a track cancelled signal for shunting movements only.
2. Home signals posts 3 and 4 will remain track cancelled signals but 3 additional SP key switches provided at down end of the platform.
3. Up home signal No 5 does not track cancel.
4. A notice board lettered "40KM/H TO CROSSING" has been erected at the up end of the platform. (O 125/89)

WN9/1989 FOUR WHEEL GOODS WAGONS. Commencing forthwith the use of four wheel wagons is confined to the following traffic movements:-
1. 66 No G/GY for briquettes Morwell Briquette Siding to Heinz at Dandenong,
2. 73 No KMQ for departmental sleeper traffic.

All other four wheel wagons (revenue and departmental) are to be treated as stored and should not be moved without reference to the Wagon Fleet Manager.

WN9/1989 EMU. Drivers on up trains approaching Emu have difficulty in sighting the switch stand on the trailable points and control of the train must be maintained so as to be able to stop at the facing points. This instruction supercedes the previous instruction in O 69/89 and will remain in force until an up two position automatic signal has been provided. (O 118/89)

WN9/1989 CRIB POINT. O 108/89 has been issued and contains amended instructions to the General Appendix regarding the operation of the sidings at Crib Point following the reconnection of No 3 road to the Naval Base Siding.

WN9/1989 STONY POINT. The down end extension of No 2 road has been removed and the crossover road converted to a simple turnout.

WN9/1989 FRANKSTON. The General Appendix instructions are to amended to take into account that Somerville replaces Baxter as the staff station at the end of the single line section. (O 111/89)

7.3.1989 OUYEN. The down end plunger lock was abolished and replaced by a trailable facing point mechanism with the normal position for No 1 road. The hand throw lever is secured by an E pattern annett lock, the key of which is electircally secured in the signal box. The annett key will be released by home signal post No 6 (lever 2) being placed to stop and a push button operated. A closing lever No 4 is provided to allow switching out through No 1 road. The light home signals on posts 6, 3 and 5 (levers 2, 3 and 6) were converted to non-track controlled signals. (O 132/89)

(continued on page 75)

LEVEL CROSSING PROTECTION

by John Sinnatt

5. FLASHING LIGHTS (GENERAL)

5.1 HISTORICAL

The Flashing Light signal was first installed in Victoria at Moorabbin Road (later Warrigal Road) between Mentone and Parkdale in 1932 (16 Mar). All crossings on the Frankston line as far as Aspendale were now protected with Hand Gates, Interlocked Gates, Wig-wags, or Flashing Lights. The decision to install followed from a recommendation made in 1930 by the Committee on Highway Crossing Protection of the Signal Section, American Railway Association, that the signal consisting of two red lights flashing alternately be adopted as standard. Flashing Lights were better suited than the Wig-wag to wider crossings and ones where approach roads came in at different angles, as additional lights could easily be provided as required. (Usually only one Wig-wag was provided at a crossing and this was necessarily mounted on one side.)

Flashing Lights were installed at over 500 crossings in Victoria. It would be difficult to compile an accurate table of all F/L crossings, but Table 5.1 has been prepared to list the Flashing Lights installed in the State up till 1940, while Table 5.2 (Page 29) lists all those installed in the Melbourne suburban area to date. Table 5.1 shows that the rate of provision for the first few

TABLE 5.1: FLASHING LIGHT SIGNALS 1932-1940

	A	B	C		A	B	C
Moorabbin Rd	Ment - Park	32-16 Mar		Princes Hwy	Buck - Winch	39-26 May	
Ballarat Rd	Bungaree (U)	32-		Nth Shore Rd	NthShore (D)	39- 2 Aug	
Bayswater Rd	Bayswater(U)	34-27 Nov	S	Kellys Road	N N Goon (U)	39- 5 Oct	S
Princes Hwy	Airc - Werr	35-12 Jul	1	Shorts Road	Merl'ston(U)	39-11 Nov	
Princes Hwy	Lara - Cori	35-26 Jul		Peterboro Rd	Cudg - Allan	40-10 May	
Sloane St	Stawell (U)	35-18 Dec		Blacks Road	Edith - Chel	40-27 May	2
Anderson St	Suns - Albi	36-26 Jun	W	Patt Riv Rd	Bonb - Carr	40- 7 Aug	
Thompson St	Terang (U)	37- 6 May		Argyle Ave	Chel - Bonb	40- 6 Sep	
Princes Hwy	Weerite (U)	37-28 May		Lochiel Ave	Edithvale(U)	40-13 Sep	S
Geelong Rd	BrooklynA(U)	38- 3 Jun	S	Station St	Sunbury (U)	40- 1 Nov	S
Main Street	Pakenham (U)	38-20 Dec	S				

Notes:
1. "Hopper's Crossing"
2. Swanpool Avenue

S. Signal(s) specially provided
W. Wig-wag Replaced

Column Headings:
A: Section or Station
B: Date Installed
C: Notes

years was noticeably slower than that of Wig-wags during the previous decade, probably because of the prevailing economic conditions. The rate increased during 1939 and 1940, but was not maintained in the subsequent War years. Evidently, emphasis was given to the South-Western line, and then to the Frankston line; by late 1940 all crossings on that line as far as Carrum (exclusive) had gained protection.

Crossings at some stations in Table 5.1 are shown as being specially provided with signals. This was for the same reason as at Wig-wag crossings: to prevent the warning from operating unnecessarily during platform stops or shunting moves. Pakenham gained Up bracket Departure Home signals with Disc; Nar Nar Goon gained Discs on a siding which paralleled the main line over the crossing; Brooklyn A gained a Home signal each side of the crossing; the other three stations each gained a single Up Starting signal (Edithvale previously lacked one, not then being a Block Post). Fully-interlocked stations Bungaree and Stawell already had signals in place or ones that could easily be shifted.

The increased road traffic in the post-war years, along with improved train services to outer suburban areas, made it necessary to step up the rate of installing Flashing Lights at open crossings. But the Railways had to fund these themselves even though road users obtained the most benefit, and so only those with very poor visibility or high accident rate could be equipped, and not even all of these. Some readers may remember the apparent reluctance of the Railways to install Flashing Lights at Boronia, scene of a number of accidents, owing to lack of funds. Even after a particularly serious collision one day in the early 1950s, in which a number of children travelling in a bus were killed, they still sounded reluctant, and this led one newspaper correspondent to suggest that Flashing Lights for this crossing be financed by public subscription! But the authorities managed to find the money for Boronia after all, and even installed an automatic two-position Light signal as well (1952-10 Oct).

After years of representations, the State Government in 1954 established a Level Crossing Fund, financed from a proportion of motor vehicle registration fees, and administered by an Inter-Departmental Committee. Flashing Light installations were now to be paid for wholly from the Fund, and this enabled the rate of provision to be markedly increased. Boom Barrier and Grade Separation projects could also now be undertaken.

Table 5.2 shows that the last unprotected crossing in the then Metro area (pre-Pakenham), Allendale Road, was equipped with F/Ls in 1970 (9 Oct). Although suburban services were extended to Pakenham in 1975, the last F/Ls in the section from Dandenong were not fitted until 1980 (7 Feb and 27 May). Even then one crossing, Progress Street on the Up side of General Motors, still remained unprotected until gaining boom barriers in 1985 (14 Dec).

5.2 MECHANISM

At Flashing Light installations at least four pairs of lights are usually provided, two pairs being mounted back-to-back on each side of the crossing. Additional lights may be provided where the roadway is unusually wide or there is more than one approach road. A single-stroke bell is also provided.

When a train enters the approach section, the controlling relay applies power to the lights and also to the flashing device. Originally this was a special relay whose contacts short circuited each light of a pair in turn, but frequent relacement of contacts was necessary due to wear from arcing, and transistor static flashing units were introduced in the early 1960s to reduce maintenance. The controlling relay now triggers a multi-vibrator (flip-flop), and the two outputs flash the lights alternately through the medium of switching transistors; two transistors are connected in parallel in each output lead to reduce the effect of open-circuit failures. The lamps were of the 13+3.5 watt double-filament type, but single-filament lamps have been used as replacements.

A reliable power supply is also essential. A 12-volt battery, typically of 120 ampere-hour capacity, is floated across a rectifier powered from SEC mains; if the mains supply fails the battery can carry the load for some hours. A dc/ac inverter may be used to feed track or signal circuits. An alarm may be given from a remote crossing by a power-off relay applying a coded tone to the station service telephone line. The Ganger also checks for correct functioning of the F/Ls on his round by operating a Test Switch at the crossing.

TABLE 5.2: FLASHING LIGHTS: SUBURBAN AREA

W'BEE/ALTONA			
Maddox Road		67-22	Oct
Mobiltown	D	53- 9	Oct
Civic Pde		67-27	Sep
Seaholme	D	54- 8	Jun
Altona	U	67-22	Oct
Paisley	D	57-11	Jun G
COR Plat	D	44-25	Aug
Galvin	U	64- 9	Feb
Aircraft	U	64-10	Sep
Hoppers Xng		35-12	Jul

BROOKLYN		
Kernot St	66- 8	Mar
Francis St	66-27	Apr
Geelong Rd	38- 3	Jun G
Somerville Rd	68-30	Jun
Sunshine Rd	64-18	Feb

ST ALBANS		
Anderson Rd	36-26	Jun
Furlong Rd	66-13	Oct

UPFIELD			
Bakers Road		59-19	Jul
Merlynston	U	39-11	Nov
Boundary Rd		48-25	Jun
Fawkner	D	59-17	Aug F
Gowrie	U	65-27	May F
Camp Road		63-12	Nov
Upfield	U	65-29	Jul F

NORTH FITZROY		
Amess Street	44- 5	Apr O

EPPING			
Keon Park	U	63-20	Dec
Set'ment Rd		61-26	May
Thomastown	U	68- 2	Oct
Mann's Xng		68-22	Aug
Lalor	U	64-26	Nov
Childs Rd		68-24	Oct

HURSTBRIDGE			
Rosanna	D	58-14	Dec
Macleod	U	58-14	Dec
Watsonia	U	54-15	Dec G
Nell Street		65-15	Jul X
Grimshaw St		59-22	Apr G
William St		59-22	Apr X
Eltham	D	69- 1	Apr
Railway Rd		68-18	Dec
WattleTreeRd		64-13	Feb
Allendale Rd		70- 9	Oct
Diamond Ck	U	59-28	Aug
Wattleglen	D	68-26	Nov

RINGWOOD			
Cemetery Ave		58- 2	Jul X
Rooks Road		56-19	Jul
Richard St		56-19	Jul X
Mitcham	D	53- 1	May
Bedford Rd		62-23	Oct
Bayswater	U	34-27	Nov
	D	57-27	Mar
Boronia	D	52-10	Oct
F T Gully	D	63-26	Mar
Upper FTG	U	64-18	Mar
Ring East	U	62-23	Oct
Croydon	D	57- 3	Oct
Moor'bark	U	49- 4	Apr
Cave Hill Rd		68-22	Feb

DANDENONG			
Centre Rd		54- 5	Apr
Westall	D	66-16	Dec
Corrigan Rd		63-23	Dec
Noble Park		54- 8	Apr
Chandler Rd		63-24	Sep

PAKENHAM			
Webster St		56-18	Nov
Sth Gipps Hwy		53-20	Dec
Hallam D		59-19	Nov
Cranbourne Rd		74-24	Oct
Berwick	U	70-23	Mar
Beac'field	D	78- 9	May
Brunts Road		80-27	May
Officer	U	78-21	Mar
Cardinia Rd		80- 7	Feb
McGregor Rd		74-11	Dec
Pakenham	U	38-20	Dec

FRANKSTON			
Warrigal Rd		32-16	Mar
Station St		65-30	Jun
Lochiel Ave		40-13	Sep
Swanpool Ave		40-27	May
Argyle Ave		40- 6	Sep
Mascot Ave		40- 7	Aug
Eel Race Rd		55-23	May
Armstrongs Rd		61-16	Jun
Seaford Rd		55-10	May
Wells Road		55- 4	May G
Skye Road		47-17	Jul

Notes:

1. Where the crossing is situated at a station, the station name is given rather than the roadway (U - Up end, D - Dn end).
2. Except where Wig-wags had been installed (Table 4.1, Page 13, last issue), and at Hallam (which had hand gates), all the crossings listed were previously unprotected.
3. All the crossings eventually had boom barriers added, except where a letter is shown after the date of installation. The letters mean:

   F - F/Ls still exist (Sep 88). O - Converted to open crossing (later closed).
   G - Grade separated. X - Crossing closed.

5.3 TRACK CONTROLS

A minimum warning period of 20 seconds is given for a train travelling at maximum permissible speed; for an 80 km/h limit the minimum approach section would thus be 444 metres. As with Wig-wags, Flashing Lights were at first controlled by treadles ("rail contacts") unless the line or station was already track-circuited. The earliest installation, at Moorabbin Road (later re-named Warrigal Road), was controlled by treadles; these were arranged similarly to those controlling the Wig-wag at Exley Road on the same line (Fig 4.2), except that T2 and T3 were situated on the Down side of the crossing. The single-track F/Ls at Shorts Road were also controlled by treadles. This was the next crossing along from the Wig-wagged Bakers Road and the approaches for the two overlapped, but each had its own set of three treadles. Operation of the Shorts Road lights was repeated by a bell in Merlynston station office, as was that of the Moorabbin Road lights in Parkdale signal box.

The F/Ls at Hopper's Crossing on the automatically-signalled Geelong line were controlled by track circuits, so those at the crossings some distance north of Corio and at North Shore would have been also, as would those at Anderson Street, beyond Sunshine. The F/Ls at the track-locked station of Bungaree were also controlled by track circuits. Nothing more is known about controls of the other Flashing Lights listed in Table 5.1 except that lowering the Up Home at the Geelong Road crossing at Brooklyn A would start the lights even if no train was approaching. This would have been also a suitably simple way of starting the lights for an Up train at Bayswater, but not at Pakenham (from No 1 road), Nar Nar Goon, Edithvale, or Sunbury, where running of expresses would have to be allowed for, and an approach section would be necessary to obviate the undesirability of the lights starting before the train had passed the Distant.

Track circuits were used exclusively for controlling new Flashing Lights from the early 1950s, and existing treadle installations were also converted. As explained in 4.3, track circuit control gives better protection as with treadles the lights stop when the front of the train reaches the crossing (near or far side), whereas with track circuits they continue operating until the rear of the train passes the insulated joints.

5.4 SIGNAL CONTROLS

Although over 100 signals were specially provided at non-interlocked single-line stations throughout the State on account of Flashing Light installations, together with signals at some interlocked stations, only a very few were specially provided on double lines. Apart from the Up signals at Edithvale and Sunbury (both Semaphores) listed in Table 5.1, the only ones readily thought of are a Down Home (Light) signal at Bayswater (1957-27 Mar) protecting the Down end level crossing, and Up Automatic D1632 at Officer (1978-21 Mar). While not specially provided, Automatics L691 which replaced the Down Starting at Mitchamin 1958 (7 Sep) and L672 which replaced the Up Starting in 1960 (13 Nov) were specially controlled by levers to prevent unnecessary operation of Flashing Lights ahead during shunting movements (see Figure 5.1, which is simplified with some details omitted). The next example was not until 1972 (20 Feb) when D664 which effectively replaced the Up Starting at Westall was controlled by a lever at Springvale because of the F/Ls at Centre Road. A number of Automatics between Mordialloc and Frankston were similarly controlled when three-position signalling was installed in stages 29 Oct 1976 - 23 Jan 1977.

Where the signal is a mechanically-worked Semaphore situated close to to the crossing, as was the case with the Down Starting at Mitcham, and is not lowered to start the Flashing Lights until after the train enters the approach track, insufficient warning may be given. With a Light signal, however, a time delay can easily be imposed such that in the same circumstances the F/Ls start

at once but the signal does not clear until 12 to 15 seconds later. This delay was introduced into the controls of Automatics L691 and L672 at Mitcham (Figure 5.1) in 1966 (16 Sep), and its provision is now standard practice. The delay was removed from L672 when the crossing just beyond at Richard Street (RS), which gave access to the Brick and Tile Works, was closed in 1970 (15 Jan); the signal was still within the Up approach section for Rooks Road (RR), but this crossing was apparently sufficiently far ahead for the delay to be considered unnecessary. Another delay applied with Light signals is for the F/Ls to continue operating for a period if the signal lever is put back while a train is in the approach section; this provision allows for the possibility that in these circumstances the train might not be able to stop before reaching the crossing.

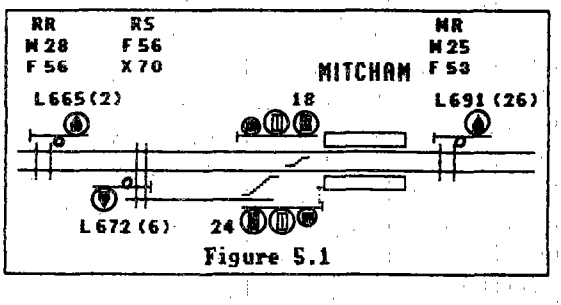

Figure 5.1

As previously mentioned, the approach section is long enough for the Flashing Lights to operate for at least 20 seconds before a train travelling at maximum permissible speed arrives at the crossing. Where a station platform is situated within the approach section and a suburban train stops for the usual period, the warning might be increased up to around 60 seconds. To reduce this excessive warning, approaches were shortened at certain crossings on suburban lines where all trains normally stopped. Provision of an automatic approach-operated and time-delayed signal was then necessary so that the occasional non-stopping train would be slowed down sufficiently to give adequate warning. The first crossing to receive this treatment was the one at Boronia Road, Boronia (Figure 5.2), where a normal approach section would have started at the left-hand end of the diagram. Instead, two-position Light signal L1053 was provided at the same time as the F/Ls in 1952 (10 Oct); this was not a block signal, the line being still worked by Electric Staff. The notification in WN 43/52 stated: "The signal is equipped with a time-delayed long-range indication and is provided to prevent unnecessary operation of the Flashing Lights by Down trains". Further details are not known, but may have been similar to those at Thomastown, described below.

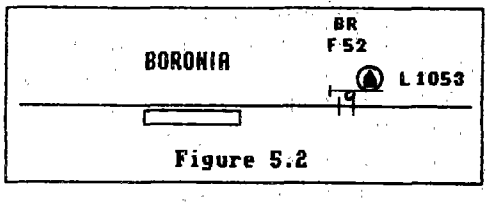

Figure 5.2

A two-position automatic signal E was provided at the Heyington Avenue crossing at Thomastown (Figure 5.3) when Flashing Lights were installed in 1968 (2 Oct). The F/Ls started, and the signal cleared, about 20 seconds after an Up train passed point B, i.e. at about the time it came to a stand. If the train was not to stop, and passed point C in less than 20 seconds from B, the F/Ls would then start, but the signal would not clear until about 15 seconds later, so as to give adequate warning. The existence of the staff-locked Goods siding necessitated provision also of push buttons for controlling the signal and Lights during shunting movements.

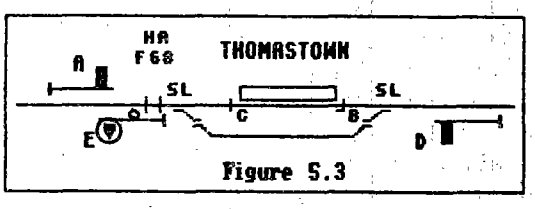

Figure 5.3

Somewhat similar arrangements were seen at Mobiltown (three-position signal WR507) from 1967 (22 Oct), and at Wattleglen (specially-provided unnumbered two-position signal) from 1968 (26 Nov), but the timings depended on the relative positions of the platform, signal, and crossing. At Mobiltown the F/Ls started about 10 seconds after a Down train entered, and the signal cleared about 15 seconds later; at Wattleglen they started about 25 seconds after a Down entered, and the signal cleared about 5 seconds later.

5.5 SELECTIVE SPEED CONTROL

A crossing may be provided with alternative approaches for express and stopping trains; the class of train being identified by means of timing track circuits or push buttons. For example, at Thomastown it could be arranged for an Up express to start the F/Ls when it passed the Home signal on the right in Figure 4.3 if the signalman at Lalor had pushed a button beforehand. "Selective Speed Control" was first applied to Flashing Lights installed at Heatherton Road on the Up side of Noble Park in 1954. The Weekly Notice item gave no hint of this, saying only that the F/Ls were controlled through track circuits and the Down Home and Up Starting signals. The following notes on Noble Park are based on information given in a paper by D E M'Cauley, "Level Crossing Protection in Victoria", presented to the IRSE on 17 February 1967.

Referring to Figure 5.4, as the allowable speed was 60 mph (96 km/h, not 100 at that stage), the traditional design for a minimum 20 seconds warning would have all trains starting the Lights at point A, which was 1760 feet (533 metres) from the crossing. But the section CD was long enough for an approach for stopping trains, and using this could reduce the warning period by 40 to 50 seconds. From calculations and tests, and taking into account the timing relays then available, it was found that a stopper could be distinguished from an express by a two-stage process. A timing track TA was set up, and if this was traversed in more than 14 seconds, implying an average speed of less than 40 mph (64 km/h), the section AB would be cut out of the approach. The train would then be timed again over AB, and if this was traversed at an average of less than 35mph (56 km/h) then BC would also be cut out. So a train which slowed down and stopped in the platform should not start the Lights until it departed and passed point C. One problem found was that occasionally a Parcels Coach would beat the timing over TA and start the Lights, but would then brake smartly and spend several minutes at the station loading. The office was then at the Up end of the platform, and the answer was to arrange that the Lights would stop again if the train or coach took more than 12 seconds to traverse BC. This feature is known as "time cut out".

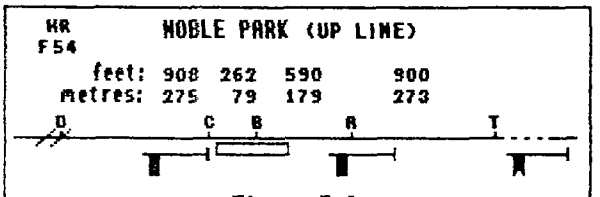

Figure 5.4

The Noble Park scheme cannot suitably be applied where the station is close to the crossing, because the timing section, although the same distance from the crossing, might be too far back from the platform to distinguish reliably between an express and a stopping train. The platform track at the preceding station could then be used for the timing section; this assumes that a train will stop at both stations or not stop at either. Selective Speed Control using this method was applied to the Down approaches to the crossing at Mitcham Road (MR, Figure 5.1) in 1971 (17 Jan), with timing effected through the platform track at Nunawading. Signal L691 at the crossing at Mitcham was then held normally at Stop even when its lever was reversed; this catered for the possibility that a Special (or other) train might stop at Nunawading but be timed to run non-stop through Mitcham. For a train registered as a stopper the F/Ls started after the train entered the platform at Mitcham and the signal cleared some seconds after that; for an express the signal cleared as soon as the timing was completed, i.e. when it passed the joints beyond the end of the platform at Nunawading.

The scheme just described would not be satisfactory if many of the trains which stopped at the first station were scheduled not to stop at the second, as they would be slowed down there considerably. In this case a push button to identify an express could be provided in the signal box in the rear, or else two separate buttons, one for each class of train. This latter was done when three-position signalling was installed through Noble Park in 1971 (9 May). Automatic D846 which replaced the Up Starting signal in Figure 5.4 was held normally at Stop. For a stopper it cleared a specified time after the train entered the platform, and for an express when the appropriate button at Dandenong was operated. The change would have been necessary to enable D846 to clear for an express well in advance of the then preceding signal D892 being passed.

A station may have selective speed control applied by push button to one of its own signals. This was done at Croydon in 1970 (20 Aug) and at Fawkner a few days later (26 Aug) where the Down outer Home (Figure 5.5) was replaced by a Light signal at the same time; it was then held normally at Stop even when its lever was operated. The Lights at Boundary Road (BR) now started about 25 seconds after a stopper passed point A, and the signal cleared at the same time. For an express, if a button in Fawkner box was operated while the approach ahead of A was unoccupied, then the signal cleared at once and the F/Ls started when the train passed this point. The treadles which originally controlled the F/Ls at Shorts Road (SR) would have been replaced by track circuits on or before the duplication in 1959 (19 Jul). The Home arm above the Distant was worked by a quadrant on the platform at Merlynston and was normally at Proceed; another quadrant controlled Fawkner's Up Starting.

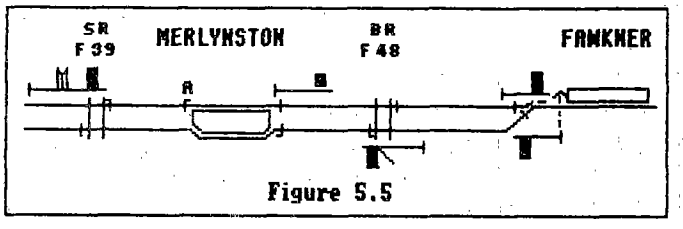

Figure 5.5

A method that does not depend on timing sections or push buttons is in use at Pakenham. When Down Home signal No 4 shows Normal Speed indications an approach calculated for 115 km/h applies for the crossing ahead, but when it shows Medium Speed the approach is suitable only for 40 km/h. At some interlocked crossing stations with two-position Home signals on single-track main lines where No 2 is the straight road, shortened approaches apply for arriving trains when the route is set for No 1. An example is given in Part 6.

The identification of a train as an express or a stopper may be made (by timing track circuit or push button) at a station some signal sections back from the crossing, such that a second train, or even a third, could depart before the first arrived; more than one crossing may also need to be considered. In such circumstances means should desirably be provided for each train to carry its classification "stopping" or "non-stopping" along with it. A simple method is to provide a normally de-energised Progression Relay (PR) at each intermediate signal, with the level crossing approaches normally set for an express. If the train is registered as a stopper, each PR picks up in succession provided that the track section ahead is clear, and the approaches are shortened accordingly. As the train progresses, each PR drops out behind it so that the next train will be treated as an express unless a stopper is again registered. In the latter event the PRs pick up again (or stay up) as far as the signal behind the preceding train; as this train progresses so does the picking-up of the PRs.

The "Progression System" finds greater application to boom barrier installations than to Flashing Lights, but on the Mordialloc - Frankston line from 1977 to 1983 by which time all intermediate crossings had been equipped are provided with two push buttons for each direction, and when a box switches

5.6 INTERMEDIATE SIDINGS

As stated in 5.1, sidings on single lines will be covered in Part 6. On double lines, intermediate sidings near crossings equipped with Flashing Lights tended to occur in three-position signalling areas and be secured by Electric Switch Locks. The first one locked in this way to be mentioned here, at Chelsea, is not strictly an "intermediate" siding, but the description forms a suitable introduction to the more complex arrangements at Tynong and Officer. Although the Goods sidings at these places have now been abolished, the details were considered sufficiently interesting to warrant description here.

The trailing connection to the siding at the Down end of Chelsea (Figure 5.6) near the Argyle Avenue (AA) crossing was formerly locked by Annett key, but was equipped instead with an Electric Switch Lock at the same time as three-position signalling was instituted to Carrum in 1976 (19 Dec). The points are in the block of Home signal No 4, and the Lock is released by lever 15 in the signal box. Signal F1059 would be kept at Stop by its lever while the train was approaching or shunting, but if a move would foul the crossing then operation of an adjacent push button would start the Flashing Lights and the signal would clear after 15 seconds. An unusual feature here is that as the stopping outer approach for the boom barriers at Bondi Road, Bonbeach (BR), commences immediately on the Down side of the Argyle Avenue crossing, the next signal along, F1087 (Bonbeach 4), must also be controlled by Chelsea to prevent a shunting movement from unnecessarily holding down the booms behind an Up train.

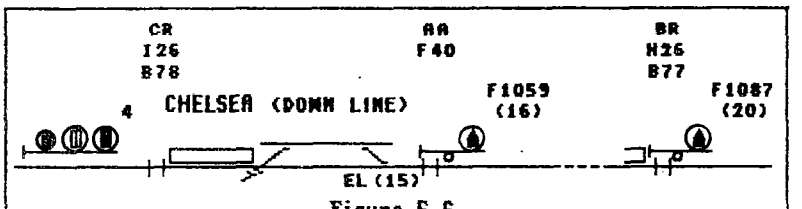

Figure 5.6

Signal F1059 at Argyle Avenue is subject to Selective Speed Control; the express approach starts from signal 4, while the stopping approach starts 36 seconds after the train enters the platform, which is at about the time that the train departs. The writer was interested to notice while watching this signal one day that it went from Stop to Warning instantly the Driver of a train in the platform whistled. It looked like cause and effect, but it really meant that the designer had got his timings exactly right, at least for this particular train.

Tynong was a permanent Electric Staff station in the single-line days, but when duplication was completed through the station in 1957 (7 April) the signal box was abolished and the siding points were secured by Electric Switch Locks, released by track circuit only (Figure 5.7). The Up end points were close to the level crossing at School Road (SR), and when Flashing Lights were installed in 1974 (12 Sep) special arrangements had to be made to cater for shunting movements in the vicinity. Moreover it was desirable that unduly long warning not be given for stopping passenger trains. The platform was far enough back from the crossing, about 701 metres, for the stopping approach to be able to start from point D; the express approach started at A.

The scheme adopted at Tynong was somewhat similar to that at Noble Park but more elaborate. Original track circuits TB and BE were subdivided into five; threshold timings for the sections TA, AB, BC, and CD, were 3.3, 3.7, 11, and 10 seconds respectively. The lengths and timings were based on round-figure speeds in mph, so these will be given as well as the km/h equivalents. The first section, TA, is for timing only; if the speed is less than 60 mph (96 km/h) then AB is cut out of the approach. If speed over AB is less than 45 mph (72 km/h) then BC is cut out; if speed over BC is less than 35 mph (56 km/h) then CD is cut out. Finally, if speed over CD is less than 20 mph (32 km/h) then DE is cut out.

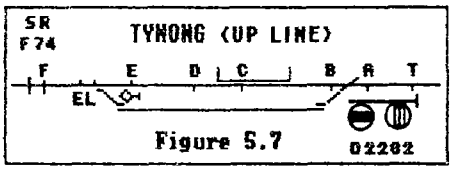

Figure 5.7

A shunting goods is to stop at the diamond-shaped Approach Section Indicator at point E so that it won't start the Lights. The door of the ESL is then to be opened; this action cuts out EF and the train can then shunt as required, push buttons being provided to control the Lights if a move should foul the crossing. But what about a stopping passenger? If CD is occupied for longer than 10 seconds then DE is cut out. How then does a stopper start the Lights at D? The answer is that if CD is occupied for a further 25 seconds, making 35 in all, DE is cut in again! One cannot help but be impressed by the design of the controls at Tynong.

(Approach Section Indicators are provided at the Up end of the Up platforms at Yarragon and Trafalgar, which suggests that shortened approaches are provided there for stopping trains. It is understood that these trains are not distinguished from expresses in advance of arrival, but that all trains start the Lights at the express strike-in point. If the platform track is occupied for more than a certain period, perhaps 30 seconds, then the Lights stop, but start again when the train departs and passes the Indicator.)

The last station to be dealt with here is Officer. Before duplication this was also a permanent Electric Staff post, but the platform was located on the Up side of the crossing, which was fitted with hand gates worked by the station staff as at Longwarry. The new station (Figure 5.8) was opened in 1956 (13 Mar), the layout then being similar to Figure 5.7 except for the side platforms. One Up signal only was provided, D1648, which was normally at Proceed. The gates were abolished, leaving the crossing at Station Road (SR) unprotected.

Flashing Lights were provided eventually in 1978 (21 Mar), but the conditions could not be met in the same way as at Tynong because the station was much closer to the crossing, and it is unlikely that a timing section to the rear of point A would give reliable discrimination between an express and an electric stopping train. Two push buttons were therefore provided at the signal box in the rear, Pakenham, but this meant that an additional signal normally at Stop, D1632, had to be installed at Officer in case an express was wrongly identified as a stopper. This signal clears when the express button is operated, and the Lights start at A, but for a stopper the signal clears and the Lights start "when the train departs from the platform" (WN 15/78). Neither button at Pakenham is pressed for a shunting goods, which is to stop at a Notice Board at the end of the Up platform at Officer. This corresponds to the ASI at Tynong and operation is then similar, except that pushing the local button clears the signal (presumably after a delay) in addition to starting the Flashing Lights.

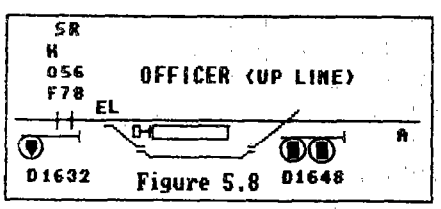

Figure 5.8

Insertion of new signal D1632 at Officer meant that Normal Speed braking distance was no longer available ahead of D1648, and so a lower working unit had to be fitted to make it show Medium Speed Warning when D1632 was at Stop. But signal D1722 in the rear of D1648 was not altered to show Reduce to Medium Speed, so D1648 has to remain at Stop for a stopping passenger or shunting goods until D1722 is passed. It would of course be cleared by operating the express push button.

(The writer thanks member Colin Rutledge for supplying information on treadle-operation of early Flashing Light installations, and on timings at Tynong.)

(End of Part 5)

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SIGNALLING ALTERATIONS (continued from page 65)

6.3.1989 FLINDERS STREET. The illuminated speed indicators on posts 777, 669, 787 and 679 were altered from 40 to 65 indicating 65 km/h maximum speed. (O 2084/89)

7.3.1989 SPEED. All plunger locking and fixed signals were abolished. Trailable facing point mechanisms were provided on the main line points at each end. Up trains will run via No 1 road and down trains via No 2. Non-trailable mechanisms were provided on the points leading from No 2 to No 3 road. Rodded derails and wheel crowders were provided at the down end of NO 3 road and rodded safety points are provided at the up end of NO 3 road. Locations boards have been provided. (O 126/89)

WN10/1989 MILDURA LINE. The sidings at the following stations have had the miniature staff locks replaced by large type staff locks on the undermentioned dates. (O 133/89)
Wed. 1.3.1989 KINNABULLA, KIAMAL, NUNGA.
Thur. 2.3.1989 CURYO, WATCHUPGA.
Fri. 3.3.1989 TEMPY, NUNGA (completed).
Mon. 6.3.1989 TURRIFF, GAMA.
Tue. 7.3.1989 GAMA (completed), LASCELLES.
A large type Master Key has been provided at Donald and Ouyen. When it is necessary for shunting to take place, a competent employee must take the appropriate Master Key to the location where it is required and return it after the shunting has been completed.

7.3.1989 KOO WEE RUP. The down approach to the flashing lights at Rossiter Road was shortened to the down side of the platform. A board lettered "25 KM/H MAXIMUM SPEED TO LEVEL CROSSING" was provided. (O 152/89)

7.3.1989 LANG LANG. The up flashing light approach to the flashing lights Western Port Road was shortened to the upside of the platform. A board lettered "20 KM/H MAXIMUM SPEED TO LEVEL CROSSING" was provided. (O 151/89)

WN11/1989 BACCHUS MARSH-BALLAN. Until further notice, the speed of up Superfreighter and Express Goods trains operated by G, B or N class locomotives must not exceed 65 km/h. (O 167/98)

WN11/1989 REGULATION 133. This regulation has been amended to permit red or white reflectorised discs or chevron stripes to be exhibited inlieu of red or white lights on buffer stops of refuge sidings, or on vehicles that have been placed in these roads in an emergency. (O 165/89)

19.3.1989 TRAIN TO BASE RADIO. A trail "line free" tone was installed on channel 3 (Geelong to Mildura line) between Maryborough and Mildura. When the line free tone is heard no conversation is taking place and a call may be initiated to Control. (O 201/89)

WN12/1989 TRAIN ORDER RULES. Train Orders may be fulfilled without the train being brought to a stand. This applies within a train order territory or when leaving train order territory. (O 203/89)

19.3.1989 DUNOLLY-MILDURA. Train Order working will replace the existing electric staff and staff & ticket working. The first train issued with a train order was 9118 on 19.3.1989. The train controller may issue a Train Order to the signalman at Maryborough for down passenger trains. The signalman must then hand to the driver of such a train the Train Order, an electric staff for the section Maryborough-Dunolly and a Master Key. The Train Order must not be issued, however, if an unfulfilled order exists for the section Dunolly-Emu.
END OF TRAIN DETECTION will not be provided at this stage. All locations will be attended and follow on movements will be permitted only between attended locations.

MASTER KEYS

15 large type Master Keys Nos 31-45 and 2 miniature type Nos 47-48 have been provided. The Master Keys will be lettered as follows:-
Nos 31 and 32 - Maryborough-Mildura for passenger trains.
Nos 33 to 45 - Dunolly-Mildura.
No 47 - Mildura-Irymple.
No 48 - Irymple Local.
The Master Keys will be located as follows:-
Maryborough - 1 large type for passenger trains.
Dunolly - 5 large type.
Donald - 2 large type.
Ouyen - 2 large type.
Irymple - 1 miniature type for local movements.
Mildura - 4 large type.
1 large type for passenger trains.
1 miniature type for Redcliffs shunting trips.
Donald and Ouyen will become Intermediate Terminal Stations. Until further notice Birchip must be attended when trains are required to shunt there. Train crossing stations are Emu, Sutherland, Donald, Watchem, Birchip, Woomelang, Speed, Ouyen, Hattah, Carwarp, Redcliffs and Irymple. (O 170/89)

WN12/1989 DONALD. The driver of an up train standing in the crossing loop may be issued with a train order by the train controller whereas for a down train, the train controller may issue the train order to the signalman at Donald who will deliver it to the driver of the train. (O 169/89)

WN12/1989 REDCLIFFS-IRYMPLE-MILDURA. When a train order is issued to the Redcliffs switch to run from Mildura, the train controller may include in the instructions "SHUNT AS REQUIRED" On arrival back at Mildura, the signalman must advise the train controller that the Master Key has been returned. (O 169/89)

WN12/1989 IRYMPLE must only be used as a Train Order Crossing station inconjunction with switching movements between Mildura and Redcliffs. If the Rail Tractor is required to shunt on the main line, verbal permission from the train controller is obtained for No 48 Master Key to be released, the signals must also be placed to the stop position. Whilst the tractor is occupying the main line, the train controller may issue a Train Order as far as the down home signal at Irymple. When the tractor is locked away again, the train controller must be advised and the home signals cleared. (O 168/89)

20.3.1989 JACKSONS LOOP - PORTLAND. Continuous end of train detection tests will be conducted at Jacksons Loop and all loops between Maroons and Portland. During this period, the equipment must not be relied upon for follow on moves. Follow on moves are only permitted between attended stations. (O 102/89)

20.3.1989 CRIB POINT. Baulks were provided at the boundary fence line on the up leg of the Naval Base triangle. (O 211/89)

21.3.1989 TALLAROOK (SG). Up home signal TLK10 was abolished. (O 188/89)

22.3.1989 BIRCHIP. Non trailable point machines were provided on the points leading from No 1 road to the Silo Road, and aso on the points leading from No 2 to No 3 road. The hand locking bars and annett locks were abolished. The machines in No 1 road were provided with F pattern annett locks and those in No 2 road with E pattern locks. A Master Key (ST21) type to the E and F pattern Annett Key Exchange Apparatus was provided on the platform. Removal of the Annett Keys will restore the respective arrival home signals (E for the down and F for the up) to stop. An E and F pattern annett lock was provided on the up and down end trailable points respectively. The up arrival home signal was converted to a non-track controlled signal. (O 166/89)

23.3.1989 ARARAT-PORTLAND. Electronic End of Train Detection was commissioned at Jacksons Loop, Willaura Loop, Glen Thompson, Dunkeld, Grampians Loop, Chrome Loop, Myamyn Loop and Gorae Loop. The standard end of train marker must be exchanged for a modified end of train marker whilst a train is operating in the area between Ararat and Portland. The trackside equipment will transmit on the End to End radio system a message stating that the train is complete. This message is preceded by an alert tone - a rising note for up trains and a falling note for down trains. (O 213/89)

WN14/1989 DONALD and OUYEN. To facilitate the passage of important trains, permission is granted for through train orders to be issued as required for passenger trains and also for the Fruit Express Goods. The signalmen at Donald and Ouyen are to be advised and they must ensure that the signals are cleared at least twenty minutes prior to the expected arrival of the train for which a through order has been issued. At Donald when passenger trains are to cross, the crossing will take place in the plunger locked yard but goods trains must cross at the up end loop. When ceasing duty, the signalmen at Donald and Ouyen must advise the train controller and place all fixed signals to reverse. (O 208/89)

30.3.1989 COROMBY and NULLAN. The up and down rodded derails were replaced by Hayes type hinged derails. (O 205/89)

31.3.1989 HURSTBRIDGE. The platform quadrant for the down home signal was relocated 20 metres in the up direction on the platform. (O 2112/89)

WN15/1989 PASSENGER INFORMATION DISPLAY UNITS (PIDS). PIDS units have been provided at Geelong, Lara, South Geelong, Ballarat, Bacchus Marsh, Bendigo, Woodend, Kyneton, Seymour, Traralgon and Morwell.

WN15/1989 BENALLA. Signalling diagram No 22'88 became effective and diagram No 2'72 was cancelled. The new diagram represented the "As in service" conditions at Benalla. (O 237/89)

3.4.1989 BENALLA B BOX. The following alterations were made:-
1. The right hand disc on post 35 (lever 72) leading from X to Oil Siding was abolished.
2. Dwarf signals Nos 36 and 37 (lever 112) from Siding Z to X, and from Oil Siding to X respectively, were abolished.
3. No 74 points were spiked normal and will be removed later.
4. Levers Nos 36, 74 and 112 were sleeved normal. (O 190/89)

3.4.1989 WANGARATTA. The following alterations were made:-
1. The disc on post 9 (lever 2) from A to Cattle Yards siding was abolished.
2. Ground disc post 3 (lever B) from Cattle Yards siding to A was abolished.
3. No 35 points were spiked normal and will be removed later.
4. Levers B, 2 and 35 were sleeved normal. (O 191/89)

4.4.1989 STANDARD GAUGE LINE. The following signals were converted to non lever controlled signals and were renumbered as follows:-

BROADMEADOWS	- BME/2 to ES603.
	BME/4 to ES650.
MANGALORE	- MGE/2 to ES3609.
	MGE/4 to ES3666.
ALUMATTA	- AMT/10 to ES7806.
BOWSER	- BWR/6 to ES7919.
	BWR/8 to ES7922. (O 233/89)

5.4.1989 SEA LAKE. The home signals and plunger locks were abolished. Padlocked hand locking bars have been provided inlieu of the plunger locks. Up and down location boards are provided 1000 metres in advance of the facing points. (O 198/89)

WN15/1989 NAR NAR GOON. Commencing forthwith, the panel will be switched in only as required and as arranged by the Train Controller, Transport House. (O 236/89)

6.4.1989 WEST FOOTSCRAY. Catch points No 24 and dwarf signal post 5 were relocated 21 metres in the up direction. (O 2126/89)

16.4.1989 SANDRINGHAM. Points Nos 13 and dwarf signal No SHM912 were relocated 10 metres in the up direction. Dwarf signal No SHM912 was converted to a light signal. Points Nos 8 and 13 are now operated by an Electro Hydraulic Dual Control point mechanism. (O 2136/89)

16.4.1989 CASTLEMAINE. The following alterations were carried out at the up end of the yard:-
1. Points Nos 65, 69 and 70 were abolished.
2. Lock bars Nos 64 and 68 were abolished.
3. Signals Nos 47, 50, 55, 75, 80 and 81 were abolished.

Amend diagram No 13'78 accordingly. (O 238/89)

16.4.1989 BRIGHTON BEACH. The following alterations took place:-

1. Points Nos 6, 7 and 9D were converted to Westinghouse Dual Control mechanisms.
2. Catch points No 7D are now operated by a separate Westinghouse Dual Control mechanisms replacing the rod operation from No 7U points.
3. Dwarf signal BBH905 was converted to a light signal. (O 2142/89)

16.4.1989 FRANKLIN STREET JUNCTION. Catch points Nos 412D and dwarf signal No 504 in the Engine Flyover Road were relocated 14.7 metres in the down direction. (O 2143/89)

17.4.1989 BALLARAT-MILDURA. Field testing of locomotive "IN CAB" facsimile equipment commenced on certain trains on the above section of line. The testing is expected to be of six weeks duration. The tests consist of specially worded messages being sent at various intervals from Transport House to the locomotive concerned. Locomotives fitted with the equipment are T369, X31, X44, N459 and N465, and these locomotives will be scheduled on all passenger trains together with Nos 9141/9118 Fruit Express and Nos 239/1244 goods trains. (O 246/89)

19.4.1989 IRYMPLE. The up approach section for Irymple Avenue was shortened to the upside of the platform. A speed board lettered "15 KM/H TO LEVEL CROSSING" was provided at the commencement of the approach section. The up home signal was converted to a non-track controlled signal and is approach operated six seconds after the train enters the approach section. (O 257/89)

20.4.1989 TATURA. The following alterations were carried out:-

1. The staff locked points to the Rosella Preserving Coy's siding were abolished.
2. Up home signal G and down home signal H were abolished.

(O 259/89)

20.4.1989 NARRE WARREN. Signalling diagram No 9'89 (Narre Warren-Pakenham) was issued and diagram No 47'88 was cancelled. The following alterations were carried out:-

1. Down home signal Nos 2 and 14 were converted to non lever controlled signals D1259 and D1283 respectively.
2. Up home signal No 3 was converted to a non lever controlled signal D1264.
3. The signalbox was abolished.

The diagram also shows the current arrangements at Berwick where the up end points have been removed. (O 1262/89)

WN17/1989 TOTTENHAM YARD. The following alterations were made:-

On 20.1.1989 Nos 3, 4 and 6 arrival roads were connected to Nos 5, 6 and 8 roads (1st classification yard) becoming long roads. No 5 arrival road was connected to No 4 long road. No 7 road (1st classification yard) was connected to No 6 road and renumbered No 5A West Yard. The new arrival roads were renumbered Nos 3, 4, 5 and 6 West Yard.

On 11.4.1989 No 8 road was connected to No 7 road and No 7 road connected to No 1 road. Nos 1 and 6 departure roads together with Nos 7 and 8 long roads have been renumbered the East Yard. All the above mentioned roads are available for traffic. (O 2145/89)

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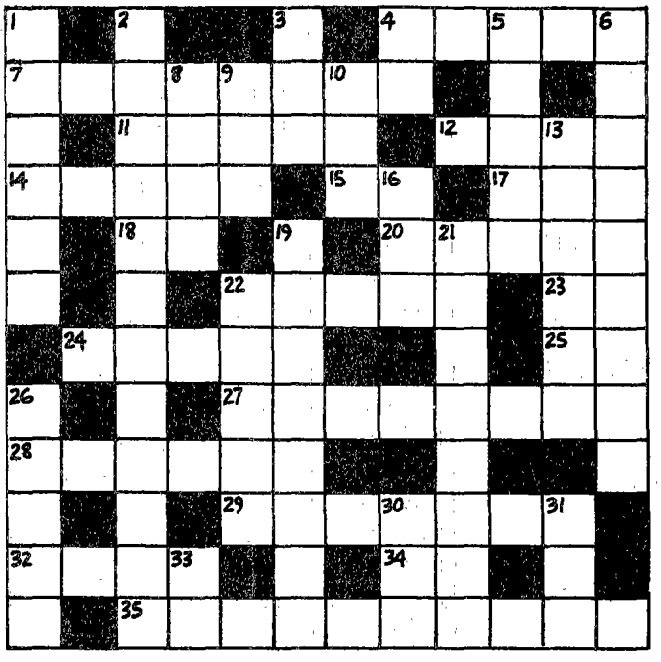
S.R.S.V. CROSSWORD No 26

compiled by Stephen McLean



ACROSS

4 and 1 down. Marian's station is before this quaintly-named terminus (5,6)
7. Casino station (8)
11. This could be standard in the north-east (5)
12. Station miles from anywhere - even further than miles! (4) (5)
14. Try ES? Not with this instrument
15. Bad to lose an article in this carriage (2)
17. Fay leaves the day after Thursday with this sort of good dance (3)
18. Nat loses time with the 2-6-2T (2)
20. The stationmaster and everyone else still don't make up a large staff (5)
22. Heads of branches often monitor blockworking out on the Illawarra line (5)
23. First class consignment from Bacchus Marsh (2)
24. Found on junction signals and in P.Pay's working timetables (5)
25. Suitable track for 18 if 24 and 11 follow north (2)
27. Station which Hogan likes re-designing, taking out two points (8)
28. Turner had change for a ticket (but it wasn't a single) (6)
29. Type of sandwich unavailable in NSW AB dining car (7) (4)
32. Low place to find engines in NSW
34. One way out of Parliament (2)
35. Crank offers railway a lever-saving device (10)

DOWN

1. See 4 across.
2. Never tie gear round this braking system (12) (3)
3. Boy seen in the past on UP train
4. Four days (not when Fay was round 17) (2)
5. Former junction - now a stopping point of many orange trains (5)
6. Distinctly non-British feature of Victorian trains (9)
8. This station in Ballarat has an island platform (4)
9. A United States steam festival? No, one in the golden south (3)
10. Diesel-electric building begins with this NSW railcar set (3)
13. Closed SA station where NG Mail shunted (6)
16. Leading dieselised system belongs on European islands (3) (4,4)
19. At present a twice-closed station
21. A few second' hesitation and you won't get up this grade! (8)
22. Planned to rob a northern Victorian station (5)
26. On this uphill stretch to begin with, ground relay alarms develop easily (5)
30. That girl on the Sydney-Goulburn train (3)
31. Fellow seen after Essen (3)
33. Safeworking system still found in the west (just!) (2)

Solutions to Crossword No 25.

Across: 1. Guard, 4. Chidda, 7. CM, 8. Express, 10. Duri, 12. TR, 13. AN, 14. Track circuit, 17. Adhesion, 21. S1, 22. Crossings, 23. Tank, 25. Epping Forest, 28. RU, 29. Toy, 30. NR, 31. Compound.

Down: 1. Great Eastern, 2. Alpha, 3. Due, 4. CCS, 5. HM, 6. Dorai, 9. Section gap, 10. DRC, 11. Intensity, 12. Transport, 15. Checking, 16. Ulan, 18. Diapur, 20. OS, 24. NP, 26. ETA, 27. Sod.

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