SIGNALLING RECORD SOCIETY (VICTORIA)

SOMERSAULT

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Dead line for September 1982 issue is 15 August 1982.
NEXT MEETING: 16 July 1982.
VENUE: A.R.H.S. Library Room, Windsor Railway Station.

Minutes of May 1982 General Meeting

HELD AT: A.R.H.S. Library Room, Windsor Railway Station. Meeting commenced at 2015 hours.

PRESENT: J.McLean (Leader), G.Inglis (Minutes Secretary), D.Langley (Editor & Archivist), M.Bau, J.Brough, R.Jeffries, A.Jungwirth, J.McCallum, S.McLean, I.Michaelson, A.Ratcliffe, J.Sinnatt and P.Stoneham.

APOLOGIES: W.Brook, T.Penn, R.Whitehead and C.Wurr.

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

BUSINESS ARISING: An official report on the derailment at Buttevant, C.I.E., may become available shortly. Wilfrid Brook will be pleased to see it.

CORRESPONDENCE:

* From Bob Taaffe regarding the reorganisation of the NSW Group and production of the UK Newsletter.
* From the Dart Valley Railway (R.Jones - SRSUK) McLean for the photograph of Ashburton, Vic. Also best wishes to the SRSV from the DVR.
* From J.Slade and D.Donald (SRSNSW) requesting information about Time Interval working in Victoria. The Group Leader was to reply directly and the results of his research will be eventually published in Somersault.

GENERAL BUSINESS:

1. The Show Day tour will be to Wodonga and Albury. Travel from Melbourne yet to be decided. If you won't be at the July or Sept. meeting, contact Jack or Alan Jungwirth for further details. Additional cost on day about $3 for Bona transport between Wodonga & Albury or vv. Interstate members will receive details in mail.

2. Signalling School, Newport - the question of our involvement in preserving elements of the school was discussed again and Jim Brough suggested that the ARHS be informed of the SRSV opinion that it should be saved if some effort can be made in the near future.

3. Meeting Room Donation - It was moved that our thanks for the use of the Library Room at Windsor and a $20 donation be sent to the ARHS. (Sinnatt/Jeffries)

4. A.P.B. article - Further to the recent article, the first part of which was published in the last Somersault, John Sinnatt sought further information from members concerning the power supply arrangements at South Yarra - whether battery power or via the Melbourne Electric Supply Company in 1915. Nothing conclusive was decided but if any member feels he has something to contribute, write to John directly or via the Editor.

5. Winter's Block article - the recent article by Graeme Reynolds and Don Martin generated spirited discussion. John Sinnatt was intrigued by the popularity of Winter's block in the Colonies and suggested that its ability to work over lines wires of fairly high resistance was the reason. John also indicated another desirable feature in that two signalmen were required to co-operate in setting the needles. He queried the effect of lightning strikes in giving false indications. Opinion was that the indications would remain unaffected because the press buttons protected things unless the instruments were actually being operated, unlike the situation in the U.K.

(Again if any member feels he has something to offer in the realm of Winter's block he can write directly to Graeme at 22 Howitt Street, Ballarat, I know he will be pleased to hear from you. - Editor).

6. 100th Anniversary of Winter's block - a short discussion ensued regarding a suitable observation of the centenary. David Langley suggested that the society visit Parkdale during the evening peak and observe the hectic block working. Whilst there are ten block posts left in the suburbs where Winter's block is worked both sides, some of them have various features which detract from the simplicity of a mechanically signalled double line block post e.g. Bell and Mentone, and of the remaining block posts, the busiest one is Parkdale where 17 down and 7 up trains are signalled between 1635 and 1831. A further attraction at Parkdale is the interlocked gates swinging merrily to the tune of the Winter's block two beat (step).

7. The diagram sheet accompanying the May 1982 issue depicting the Grain Loop at North Geelong is an addendum to the January issue of Somersault.

8. South Australia (Peterborough line) - The Electric Staff is to abolished on this line and replaced by Train Orders sometime late in 1982. It is not known whether the APB signalling between Gawler and Hamley Bridge will also be replaced. The power signals at the current staff stations will also be removed including the table interlocker at Burra. In view of the small number of these table interlocking machines remaining, it was moved that the SRSV write to A.N.R. regarding the purchase of a table interlocker if/when one becomes available. (Langley/Jungwirth).

9. New Crossing Loops on the Serviceton line - the first of the new crossing loops - Pimpinio Loop - will be brought into operation on the weekend of 24/25 July, all being well. Pimpinio station, a switching miniature electric staff crossing loop, will cease from the same time and staff & ticket will be worked on the sections Horsham-Pimpinio Loop -Dimboola for about two weeks while the CTC is connected. A local control panel will be provided for the signalman who will have full control over the arrival and departure signals. The arrival signals will work in the same style as for the full CTC - i.e. approach cleared etc for moves into the Loop but the departure signals will only be two-position until full CTC is commenced. If you haven't photographed old Pimpinio by now, you have almost missed the boat.

10. A list of current works was received and a brief summarisation appears below by courtesy:

* Morwell - up distant requested.
* North Melbourne - new crossovers are being installed near the Merri Creek bridge to replace the existing ones.
* Windsor - removal of interlocked gates (one of the oldest suburban interlocked set dating from 1887).
* Sale - the extensive redevelopment plans were discussed.
* South Geelong - the new arrangements were reported.
* Flinders Street - Black Arm Band day is Sunday 11 July. Signal boxes "A", "B", "D" and "E" succumb to Metrol.
* Newport Workshops No 2 Box - to be abolished.
* Batman - crossover to be removed.
* Rockbank - remove No 3 road (already spiked out of use).
* Eaglehawk - remove No 3 road.
* Katunga - remove No 2 road.
* Strathmerton - remove down end extensions of Nos 2 & 3.
* Newport - additional signals for shunting Werribee RM's.
* Melton - up distant becomes outer home and new up distant account new set of flashing lights.
* Dynon - abolish electronic weighbridge.
* Sheep Hills - extend siding and remove signals. Provide staff locks inlieu of plunger locks.
* Whites Siding, Ballarat - move ground frame, remove home signal and annett lock C Box down starter. Siding becomes within station limits and pilots may reverse to C Box.
* Signals removed from Moriac, Birregurra, Pirron Yallock and Allansford.
* Wedderburn Junction - reduce facilities.
* Goornong, Raywood and Dingee - ditto
* Mathoura - close staff station.
* Sunbury - more signal alterations (no details).

* Chiltern - to close as a staff station.
* Toolamba - remove Railmotor dock.
* Tallygaroopna - remove No 2 road.
* Murtoa - track alterations (probably a/c CTC)
* Ararat - alterations in loco depot.
* Deep Lead, Great Western & Lubeck Loops a/c CTC.
* Kaniva - spur sdg at up end of No 4 road.
* Wail - has a Hayes derail and wheel crowder.
* Birchip - ?
* Bank Box - extend loop to 1650 metres.
* Lascelles - to be closed as staff station.
* Dunolly - more wheat sidings.
* Sale - proposed closure of present station and removal of mechanical interlocking. provision of new station on new loop line between existing lines. Removes the need for trains to reverse at Sale.

11. Pssst! A second questionaire is under way.

MEETING CLOSED: at 2240 hours proving once again that we are our own self generating syllabus item.

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SIGNALLING ALTERATIONS

WN 10/1982. ALTONA JUNCTION-ALTONA. The signalman at Newport "A" Box will now be responsible for the issuing of Caution Orders instead of the South Western train controller. In the event of a failure of the following signals, the signalman will issue the authority as hereunder:-

Signal 208	(West Line to Altona Line)	TR13G
206	(East Line to signal 210)	TR18B
210	(to Altona Line)	TR13G
214	(Altona Line to East or West Line)	TR18B
WR608	(Altona to single line)	TR18G

In the event of WR595 (single line to Altona) failing and the illuminated letter "A" not being displayed, the Engineman must communicate with the signalman at Newport. If the signalman is satisified that the signal has failed and the line is clear and safe for the train to arrive at the platform, the signalman may verbally authorise the driver to pass the signal. If the phone is out of order then the driver is to call the guard to the front and he will act as for the signalman.

WN 10/1982 SPENCER STREET No 1 BOX. To facilitate the release of light engines from Spencer Street, authority is granted for engines signalled via the East Country Line to pass automatic signal 477 at Stop whilst track ahead is occupied by a light engine(s) at home signal No 45 Franklin Street. The above instructions apply during daylight hours and for light engines only.

15/2/1982 PORTLAND. A private siding for the Portland Grain Handling Improvement Authority was made available for traffic. The siding consists of a loop about 600 metres long and is situated on the down side of the Fawthrop St pedestrian crossing in the lead to the Portland Harbour Trust sidings. The main line points are secured by a hand locking bar.

27/10/1982 ECHUCA. A private siding account the Echuca Transport Co. P/L was constructed and made available for traffic.

27/3/1982 FLINDERS STREET "B" BOX. New signalling diagram No 10/82 was issued and diagram No 4/82 was cancelled. The discs on posts Nos 143, 144 and 145 were abolished and dwarf light signals Nos 965, 967, 968, 969, 970, 971, 972 and 973 were provided inlieu. The hand points leading from "WW" to the Workshops, in junction lead to goods sidings 1 to 4 and 5 to 9 and the double compound points leading from Workshops line and the St Kilda Siding to the West Yard are now motor operated from the panel in "B" Box.

WN 16/1982 PORTLAND. Instructions have been issued regarding the detaching of train locos at Portland Harbour Trust junction. This facilitates the operation of trains which have loading for both Portland and the Harbour Trust sidings. The pilot which waits on the Harbour line until the front portion has

WN 16/1982 PORTLAND. Instructions have been issued regarding the detaching of loading at Portland Harbour Trust junction. The Portland loading must be marshalled on the front of the train and when the rear portion has been secured, the train engines may continue on to Portland with the Portland loading. The pilot must be standing on the Harbour Trust branch whilst this move is taking place and as soon as practicable must attach to the Harbour Trust loading and clear the section.

31/3/1982 LUBECK. Post 10 has been relocated from the signal bridge to the down side of Horsham Road level crossing as a ground mast in preparation for the installation of flashing lights.

15/4/1982 GEELONG "B" BOX. Post 20 was relocated 3 metres in the down direction.

18/4/1982 SOUTH DYNON. New signalling diagram No 6/82 has been issued and diagram No 4/77 cancelled. The following dwarf signals worked by South Kensington were abolished:- 120, 170, 172, 174, 178 and 182. New dwarf signals also worked by South Kensington were provided:- 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230 and 232. The hand points and fouling points are indicated on the Control Panel in South Kensington Box.

24/4/1982 FLINDERS STREET "D" BOX. No 159 and 58 points were brought into use to provide a lead to and from the City Circle Loop Line.

27/4/1982 NORTH GEELONG "C" BOX. Dwarf signal No 20 was relocated 50 metres in the up direction and a new co-acting dwarf signal on a high mast, post No 21, was provided on the opposite side of the track.

2/5/1982 JOLIMONT-MERRI. New signalling diagram No 44/81 was issued and diagram No 17/81 was cancelled. An interlocking control panel was provided at Flinders Street "D" Box to control the points and signals at the entrance to the City Circle Loop Line from the Clifton Hill line. The signals are Nos 161, 163, 186, 187, 194, 196, 197 and 199. The points are Nos 086, 087 and 094. Signal JLI 197 was converted to a home signal. Baulks are placed at the entrance to the City Circle Loop Line at Spencer Street, Flinders Street and Jolimont.

3/5/1982 AVOCA. Avoca will be opened as a Temporary Staff Station on this date in accordance with the rules to provide for the operation of special traffic. The new sections will be Ararat "A" Box-Avoca and Avoca-Maryborough. The Safeworking Officer, Ballarat, will lock the Ordinary Staff for the section Ararat "A" Box-Maryborough and release the Temporary Staff and Ticket Boxes. Whilst Avoca is open as a Temporary Staff Station the signalman at Maryborough and Ararat "A" must STOP every train and advise the driver and guard that Avoca is open as a Temporary Staff Station.

29/4/1982 NORTH SHORE. An additional push button was provided for control of North Shore Road flashing lights during shunting operations. The push buttons are located on the upside of the roadway and on the upside of the track.

2/5/1982 FLINDERS STREET "C" BOX. Points Nos 81 and 115, and train stops for signals Nos 78, 91, 318 and 321 were converted to electro-pneumatic operation.

3/5/1982 RINGWOOD. Siding "D" was taken out of use and No 43 points were spiked normal. This alteration is due to construction works for the duplication between Ringwood and Bayswater.

WN19/1982 CORIO. Instructions have been issued regarding the arrangements for switching out the Control Panel. Before closing, the block free light for the East Line section Corio-North Geelong "A" Box and for the West Line section Corio-Lara or Little River must be illuminated. Signal Post No 40 is provided with an illuminated letter "A" light.

WN20/1982 FLINDERS STREET "D" BOX. In the event of a failure of home signals JLI186 or JLI187 at Jolimont, the engineman must communicate with the signalman at Flinders Street "D" Box. The signalman must instruct the engineman to inspect the points ahead of the signal. If the points be properly set for the intended move, the signalman may then instruct the engineman to pass the signal at the Stop position and proceed in accordance with Regulation 74.

17/5/1982 LARA. Warning bells were installed on the pedestrian crossing from the car park to the station.

14/5/1982 NEWPORT-SUNSHINE LOOP LINE. New signalling diagram No 40/81 was issued replacing diagram No 16/79. The principle alteration is that Post No 6 at Brooklyn is now the Up Home signal from "Z" to Tottenham-Brooklyn Loop Line. "X" is at the down end of No 2 road at Brooklyn.

26/5/1982 LUBECK. Lever locks were provided for levers Nos 2, 8, 10, 11, 39, 40 and 43. Push buttons have been provided to release these lever locks and a 12 second delay will occur if the approach section to the future Horsham Road flashing lights is occupied when a push button is operated.

WN23/1982 TRAIN SIGNALS. Unless specially authorised by the Chief Operations Manager, the train signals that must be carried on the rear of the last vehicle of a train are indicated hereunder:-

* Electric Suburban Type Trains - a white disc by day and two red electrically lit side lights by night must be displayed on the rear vehicle. Where a white disc is not provided, two red lights must be displayed by day or night.

* Locomotive Hauled Trains with a Brakevan in the Rear - a white disc by day and a red tail light by night. Additionally at night two red side lights (flashing or steady) must be displayed.

* Locomotive Hauled Passenger Trains without a Brakevan in the Rear - a white disc by day and two red (flashing or steady) side lights by night displayed on rear vehicle.

* Goods Trains without a Brakevan in the Rear - where permission is granted, a white disc by day and a red tail light by night must be displayed on the rear vehicle.

1/6/1982 WAIL. The down end catch points were replaced by a Hayes derail and wheel crowder.

8/6/1982 BATMAN. The crossover between the Up and Down lines was removed together with the disc signals on Posts Nos 52 and 55. Lock bar No 16 was removed and levers Nos 12, 15, 16 and 20 were sleeved normal.

7/6/1982 TERANG. No 4 road, the Car Dock and the down end extension of No 2 road were removed. A scotch block was provided at the down end of No 3 road.

17/6/1982 LALOR. The flashing lights at Childs Road were converted to Boom Barriers. The operation is automatic for Up and Down movements.

10/6/1982 CHELSEA. The co-ordination of the signalling with the adjacent road traffic signals was brought into service. The operation is automatic when the control panel is switched out and via the Boom Barrier lever when switched in.

15/6/1982 SUBURBAN ELECTRIC TRAINS. "On-train" radios were brought into service. This equipment has been provided on 50 stainless steel sets and 5 Com-eng sets. The radio symbol has been applied.to the motors that have received the radios so far.

10/6/1982 SHEPPARTON. A new siding for Total Australia Ltd. was brought into use. The loop siding is located on the Katamatite line between New Dookie Road and Grahamvale Road level crossings. The points of the siding are secured by Annett Locks and two Annett Key exchangers have been provided in order that the operations of the flashing lights at both crossings is suppressed during shunting operations. The up end Annett Key is "A" pattern and the down end "B" pattern and both keys are released from the exchangers by the "D" pattern key normally kept by the signalman at Shepparton. A new Up Home signal, Post No 18, has been provided on the down side of Campbells Siding and this signal is permanently fixed at Stop. The three sidings inside this home signal - S.P.C., Total and Campbells - are now within station limits however S.P.C. and Campbells are still staff locked. If the pilot is to work these when a train is on the Katamatite line, the Annett Key and the Master Key are handed to the shunter in charge and the movement is not proceed until the Katamatite train has passed beyond Post 18. When the Up Katamatite train arrives back at Post 18, before the signalman can authorise the train to pass the signal at the Stop position, he must ensure that the Master Key and "D" pattern Annett Key have been returned and locked away.

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SINGLE LINE AUTOMATIC SIGNALLING
(THE ABSOLUTE PERMISSIVE BLOCK SYSTEM)

by John F. Sinnatt. (continued)

5. Automatic Signals at Stop

5.1 Geelong Line

The Absolute Permissive Block system using Style-R three aspect light signals powered by a.c. was installed in stages during 1928 between Newport South Junction and North Geelong "A" Box a distance of 57.5 Kms. The existing attended crossing stations, all interlocked, were retained, along with much of the semaphore signalling; a new semaphore outer home signal was provided (replacing the distant signal-Ed.) opposite the Departure Signal at one or both ends of four of the stations. Two new unattended hand-operated crossing loops, Rock and Drome, were also introduced. Staff locks at intermediate sidings were replaced by Electric Switch Locks. Operating rules were those of the Automatic and Track Control system under the direction of a Train Controller as given in circular No C21/27.

A 6600 volt single-phase power line was run from Newport sub-station along the route and 6600/110 volt transformers installed at the signal locations. Four wires were required over the whole distance for signalling purposes (one pair for the signals in each direction) and these were erected on the same poles as the power supply line; additional wires were run as required from the signal locations to 110/6 volt transformers at the intermediate track circuit feeds. The two crossing loops were converted to remote controlled operation during 1931; three additional line wires were then required from Newport "B" Box (Newport South Junction) to Rock and three also from Werribee to Drome. New operating rules were given in C 15/31.

Initially the automatic signals were normally off but within a few months the signals in most sections were modified to normally show Stop as in Figure 7; this figure representing a section between attended stations south of Werribee although the signals are still shown as semaphores. While there may have been other reasons, we may assume that this modification was due, or at least partly due, to the realisation that it was wrong in principle to trust that signals 4 and 6 would go back to Stop simply because their circuits were opened when signal 1 cleared - strictly the opposing signals should all be proved at Stop first before signal 1 will clear. Relay interlocking circuits, for example, would contain noticeably fewer contacts if it could be assumed that a relay would necessarily drop when its control circuit was opened.

With Centralised Traffic Control it is feasible for opposing signals to be put back to Stop and proved at Stop before a Departure signal will clear, but with local control it is more convenient to prove the signals if they are already at Stop. This also facilitates release of electrically-locked siding points. Moreover the possibility of wrong operation of a stick relay, which might cause a dangerous condition, is significantly reduced if the signals are normally at Stop.

Assume now that the whole single line section in Fig. 7 is unoccupied and that the lever for signal 1 is operated to admit a Down train. When signal 1 clears, signal 3 clears a moment later, and signal 5 a moment after that. Each then stays off until the train passes, even though the lever may have been put back in the meantime, and then remain at Stop until signal 1 is cleared for a second train. The signals for the opposite direction remain at Stop the whole time.

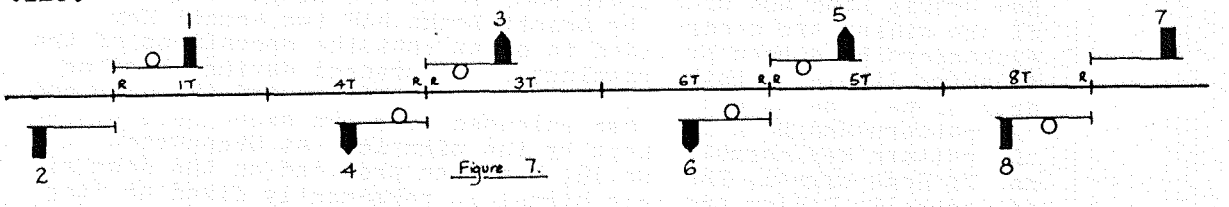

Figure 7.

Modifications were made both in the control relay (GR) and to the mechanism circuits. Relay 1GR to operate now proved signal 4 at Stop and 3GR proved signal 6 at Stop; 5GR already proved signal 8 at Stop. The overall effect was that for signal 1 to clear, signals 4 and 6 as well as 8 had to be at Stop. The GRs were still normally operated although the signals were held normally at Stop by including in the mechanism controls a contact made by the partner signals GR down in addition to its own GR up. Signal 3, for example, would now be controlled by 4 GR down as well as 3GR up. As 4GR is normally operated, signal 3 will be normally at Stop.

When signal 1 clears following the operation of its lever, relays 4GR, 6GR and 8GR drop in cascade as before but dropping of 4GR now causes signal 3 to clear and 6GR dropping a moment later causes signal 5 to clear. So signals 3 and 5 clear in succession when signal 1 clears. When the train passes signal 1, relays 4GR and 6GR stay down because 1T is now occupied, and signals 3 and 5 remain off. In effect, the signals are approach cleared by the partner GR's dropping when the Departure signal clears and remaining down after the train enters the section. No additional line wires are required for the conversion from normally-at-clear to normally-at-stop signals as the commands for the Down signals to clear are transmitted through the Up signal circuits.

One other modification is necessary. When the van of a Down train passes signal 3, relay 4GR picks up, so that as 3GR has dropped, signal 4 would try to clear. This must be prevented because otherwise signal 1 could not be cleared again to admit a second train. Relay 3SR operates when the engine passes signal 3, and a contact of this is included in the mechanism circuit of signal 4 to hold it at Stop behind a receding train. Relay 3GR picks up again (and 3SR drops) when the van passes signal 5 and signal 4 is now prevented from clearing in the normal manner.

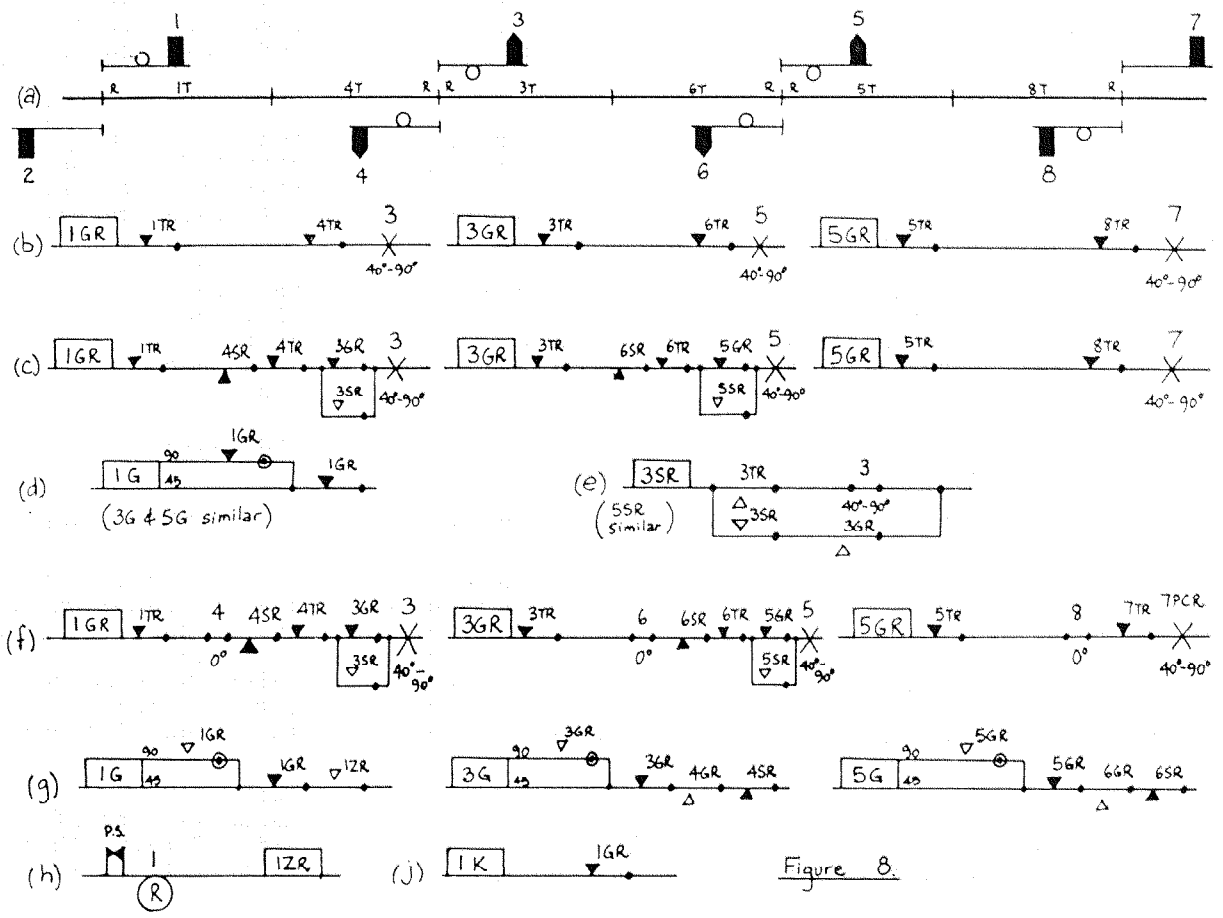

Figure 8.

The diagrams in Figure 8 show in simplified technical form the stages of development from a double line normal clear semaphore signal to a single line normal Stop APB semaphore. An element not yet explained is the "X" shown in all the GR controls. In American practice, followed also by Victoria, the 45 degree and 90 degree positions of d.c. signals are usually controlled, not by separate relays, but by a single polarised relay. This relay is fitted with both a neutral armature (picks up when current flows through coil in either direction) and a polarised armature (picks up when current flows in a particular direction only). The direction of current is altered by reversing or "pole-changing" contacts which operate as the arm of the signal ahead moves up through the 40 degree position. These are the contacts represented by the "X".

When the signal arm ahead is below 40 deg the pole changine contacts are "crossed" and only the neutral armature picks up, causing the signal to show 45 deg if the track is clear. When the arm ahead moves to above 40 deg the connections become "straight" and the polarised armature also picks up, causing the signal arm to rise to 90 deg. The polarised contact is drawn with a circle around the heel or hinge as shown in the 90 deg lead to the signal mechanism 1G in (d).

Incidently, in a.c. signalling a control relay with a three position armature is used and energy is switched from the 45 deg lead to the 90 deg lead rather than being applied to both leads as with d.c. signalling.

For Figure 8(b) - which shows the GR controls for ordinary double line signals - imagine that only the odd numbered signals in (a) are present and that all are at Proceed. The corresponding mechanism controls are as for 1G in (d). For Fig 8(c) - which shows the basic APB signal - imagine that all the signals in (a) are present and also at Proceed. The additional contacts whereby 1GR requires 3GR or 3SR up, and proves 4SR down have already been explained in Section 3. The stick relay controls are shown in (e). If signals 1 and 8 in (a) are now assumed at Stop, relay 5GR has a contact made by signal 8 arm at Stop as shown near the right hand end of (f). Mechanism 1G also has a relay contact - 1ZR - added as in (g). The ZR itself - which requires the lever reversed and the Pilot Staff (Pilotman's Key) in place - is shown in (h). The indicator - 1K - which displays "track clear" is shown in (j).

If all the signals in (a) are now assumed to be normally at Stop and still semaphores, the controls are then as shown in (f) and (g). The 1GR and 3GR controls in (f) show the additional arm contacts required while the 3G and 5G controls in (g) show the additional GR and SR contacts. The stick relay controls remain the same as in (e). In (f) the pole changing contacts have been replaced by a pole changing relay - 7PCR. This relay is provided when signal 5 acts as a distant for the station and requires signals ahead of 7 also to be off before it will show 90 deg.

When I wrote "Clear Normal Speed" (ARHS 1966 - long out of print), I felt that some attempt should be made to explain how the system with signals normally at Stop worked and also how it was simply a modification of the one with signals normally off, rather than something entirely different, but I had quite a struggle to express the ideas in non-technical terms. I wrote (references are adapted to fit Figure 7):

> "Modification of the Automatics was effected ..... by connecting each through its opposite number, so if both were trying to be off, both would stay at Stop. If signal 1 now clears, signal 4 is held at Stop and no longer tries to come off; it releases its hold on signal 3, as it were, and this latter signal now clears. After the train passes signal 1, signal 4 is still held at Stop by the train being in the section, so signal 3 still stays off. Operation of the directional relay at signal 3 suppresses clearence of signal 4 behind a down train"

At least readers of these present notes will now understand what I was trying to say.

Some of the signals on the Geelong line did not have partners but it was still necessary to provide a relay opposite to effect the approach clearing. Two of these signals were G2200 and G2249 between Corio and North Shore, and each had a full set of relays opposite - GR, HR (a slow-releasing relay corresponding to the semaphore's mechanism) and SR; these sets of relays were sometimes referred to as "phantom signals". The arrangements here were however altered in 1959 when the new West line between Corio and North Geelong "A" Box was opened.

A few other signals were without partners but these were provided with only a single relay (AxGR) opposite and behave rather unusually. One of these signals was G1986, the last up automatic on the Corio side of Lara; this is represented by signal 4 in Figure 9(a) but is still assumed here to be a semaphore.

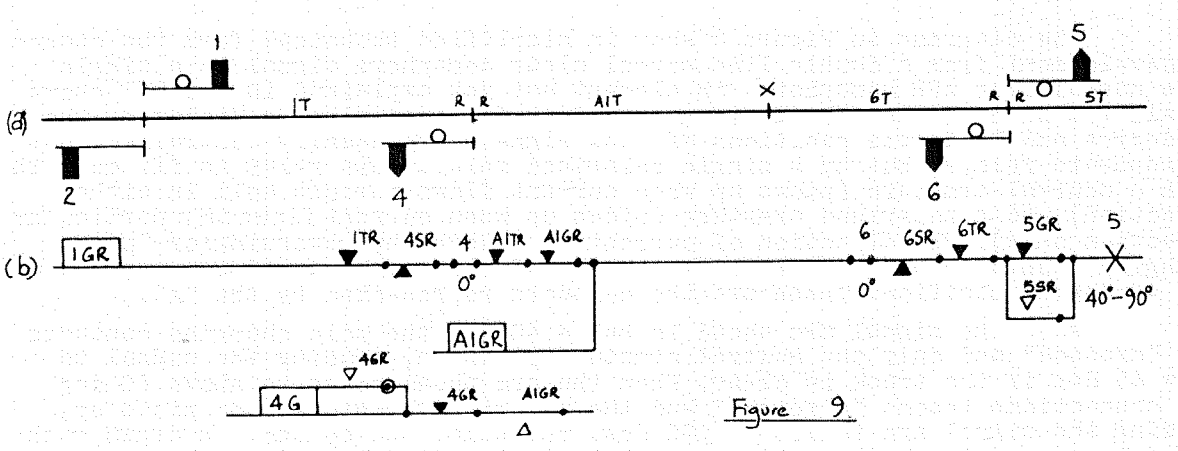

Figure 9

The relay opposite signal 4, A1GR in (b), was branched across 1GR circuit at a point corresponding to "X". This enabled signal 4 to remain at Stop when the van of a Down train passed even though a stick relay was not provided opposite, but it did mean that the signal cleared to Yellow when the engine passed "X" (this effect was observable from a train). The signal returned to Stop when the van passed signals 5/6. The 6SR contact, required in any case, ensured that signal 4 remained off when an Up train passed "X".

Signal 1 could not have been cleared for a second train until the van of the first had passed signals 5/6, so the reason originally stated for holding signal 4 at Stop would not apply. Perhaps it was done to deter the driver of a Down train from setting back, as this movement is prohibited in sections equipped with automatic signals except in special circumstances.

5.2 Geelong Line Re-signalling

The two unpaired signals between Corio and North Shore mentioned above were replaced in 1959 by one pair of Style R light signals together with an additional two-way line between Corio and North Geelong "A" Box. The "phantom" partners were then no longer required. The line from Newport South to Little River was also re-signalled with searchlights in conjunction with the provision of a second two-way line in stages from 1965 to 1970. Rock Loop became a temporary double-to-single line junction in 1967 but it was finally absorbed in the duplication in 1967 as was Drome Loop the following year. Manor station and its signals were also abolished in 1970 when the duplication reached Little River.

The lower quadrant semaphores at Laverton (1967), Werribee (1973), Little River (1972) and Lara (1973) were replaced with searchlights in the years shown when the tracks at these stations were re-arranged and new relay interlockings provided inlieu of the mechanical interlocking frames. Control of Little River was then transferred to Werribee. Lara, still with single line sections and Style R signals on both sides, received an extended crossing loop and facilities were provided for switching out. The Home signals on the main line would then work automatically and all except the Departure signals were equipped with illuminated letter 'A'. Work on completing the duplication is in hand at the time of writing (mid 1981). (Editors Note - This remaining section was completed during late 1981 in time for the commencement of the VR's revamped passenger service. Lara was re-arranged again in connection with the provision of an island platform.)

The down bracket home signal at Corio had survived the 1959 alterations and became the sole remaining semaphore between Melbourne and North Geelong "A" Box, but it too was eventually replaced, in mid-1974; so that three position light or searchlight signalling then existed throughout. One other bracket signal may be mentioned - the Down distant at North Geelong "A". This was retained after APB was installed, becoming then the signal next after automatic G2249 - a rather unusual arrangement. The writer was old enough to notice and appreciate this bracket distant but not for long, as it was removed in 1937 without any replacement.

A feature of the resignalling of the Geelong line was the much safer arrangement made at most stations to cater for opposing trains approaching the Arrival and Departure signals at the same end simultaneously. In Figure 7 the Outer Home and Departure signals 7 and 8 were separated by only a couple of metres, if that. Although for signal 5 to show Proceed all signals at the station ahead up to and including the Departure signal had to be off, to show Warning the track needed to be clear only to signals 7 and 8, and there was nothing to prevent the two-position semaphore in the rear of signal 8 from being cleared. Thus an arriving train having passed signal 5 at Warning could be approaching signal 7 at the same time as a train at the station was shunting out towards signal 8, both signals being of course at Stop. This vulnerability at the transition between the single line section and the station area, while perhaps no greater than with Electric Staff working, contrasted markedly with the effort made to ensure that the signalling between stations, as described with reference to Figure 7, was as safe as possible.

As readers of "Newsrail", May 1979 and August 1979 issues, may remember, a head-on collision did in fact occur a short distance on the station side of the Up Outer Home/Down Departure signals at Little River one day in 1938 (May 30), when the 7 05 am Up Geelong passenger ran into a Down Goods. The two signals are clearly shown in a photo of the wreck in the May 1979 issue. According to the article the Pass "ran through" automatic signal G1680 as well as the Outer Home, but when I explained to the author that I was reasonably certain that the automatic would have been at Warning, he agreed that he had no evidence that the train had wrongly passed the automatic at Stop.

(I have good reason to remember this accident myself because I was waiting at Geelong that morning for the following train, the 7 50 am Up (stopping Werribee and Newport only, arrive Spencer Street 8 50 am) but had to leave there instead by replacement bus to Little River. I happened to be carrying a Baby Brownie camera and while waiting for the relief train was able to photograph the unusual sight of a D2 locomotive inclined at about 45 degrees with its leading bogie mounted on the chimney of an A2 locomotive. This was the only railway photograph I remember ever taking but the print has unfortunately long since disappeared.)

The first sign of improvement at the transition or interface between the single line section and the station area was seen at Newport South in 1946 when three-position signalling was extended from Newport. An additional Up automatic G456 was installed on the Geelong line side and controlled by lever 6 in Newport "B" Box. This lever would have been interlocked with the facing points leading to the Up line, and so if the signal was cleared a Down train would be held back from the junction, rather than being able to come right up to Departure signal 22 which was situated opposite the Up Arrival home. Diagrams of track and signal arrangements in the Newport South area at various stages are given in the ARHS "Divisional Diary", January 1968 issue.

Lever control was again applied to automatics at Corio and North Geelong "A" when the section was duplicated and re-signalled in 1959. The Down automatic approaching Corio, for example, was interlocked with the Up arrival homes at the other end of the station. A technical point may be noted here concerning lever control of an APB automatic signal. If signal 5 in Figure 7 were controlled from the station ahead, it would not be satisfactory to insert the lever contact in the 5GR circuit in Figure 8(f) because when the lever was normal, 5GR would be down and signals 3 & 1, as well as 5, would be held at Stop. Moreover, signal 6 controlled by 5GR down, would be normally off. The lever contact must therefore be inserted in the mechanism circuit to avoid affecting the other signals. This necessitates running an additional pair of wires from signal 5 back to the station. Even if controlled by a lever, signal 5 may still be controlled also by 6GR down, or if unpaired (as was G456 at Newport South until the alterations made in 1967) by the arrangement shown for signal 4 in Figure 9. It would thus remain at Stop when its lever was operated unless signal 1 has been cleared or a train had entered the section.

Quite different arrangements were made at stations on the Geelong line affected by the 1965-1973 works. Figure 10 shows the basic track and signal arrangement now adopted although it does not represent any particular station and variations are possible.

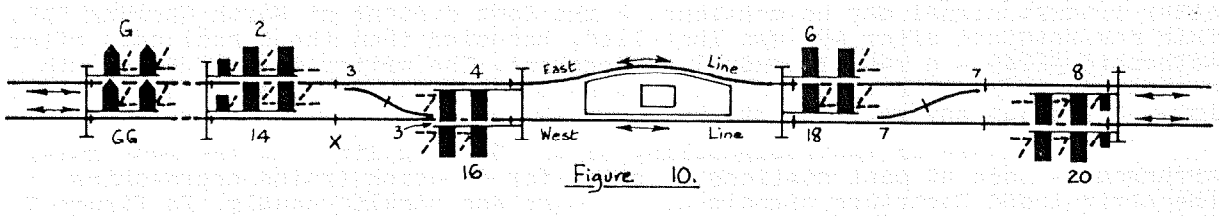

Figure 10.

The signals are of course searchlights but are drawn here as semaphores so that the aspects displayable may be more readily indicated. Signals 2 & 14, and 4 & 16 are now separated by at least 300m, often much more. This separation is, I believe, at least twice the braking distance assessed for an average loco-hauled passenger train travelling at medium speed (40 kmph). Down automatic signals G & GG at these stations are not controlled by levers but they now show Medium Speed Warning rather than Normal Speed Warning when the signals ahead are at Stop; the track circuits must however be clear to the joints at 'x'. Up arrival home signals 8 & 20 similarly show Medium Speed Warning when signals 4 & 16 are at Stop provided that the overlap to 'x' is clear. Unlike the other signals mentioned, Departures 4 & 6 show Normal Speed Warning, as do signals 16 & 18, when the points are set for the straight road.

There could be cause for opposing trains to be approaching signals 6 & 8 at Stop simultaneously if the Up were to be routed through crossover 7 but had to be held at signal 8 until a train on the other line went through. In these circumstances, provided that the line between signals 6 & 8 was clear, the Down train would receive Yellow over Green on signal G and Red over Yellow on signal 2 before finding signal 6 at Stop. The Up train would similarly encounter Yellow over Green and Red over Yellow on the two signals to the rear of signal 8. Thus both trains would receive ample warning of the Stop indication ahead, and even then reasonable room is left for an over-run.

It is evident that the new arrangements at the interface between the single line section and the station area are very much safer than those which formerly applied at stations like Little River.

Somewhat similar arrangements are to be found at Deer Park, and at Deer Park West Junction the Down home signals are set back far enough for the preceding signals to be controlled by medium speed overlap track circuits stopping clear of the points. It has been said that similar practice will be adopted at the new CTC crossing loops being provided between Ararat and Serviceton.

5.3 Other Country and Goods Lines

A country or goods line for the purpose of these notes is one in which the signals are not equipped with train stops. Absolute Permissive Block was installed on the newly-singled Albion-Broadmeadows goods line late in 1961. Six pairs of intermediate searchlight signals were provided, all normally showing Stop. The double-to-single lines at each end were originally worked from local panels, and the last APB automatic signal in each direction was also controlled by the same lever as the home signal ahead; this meant that the facing points had to be set correctly before the automatic could be cleared. The Departure signal was located back from the points on the double line side.

Control of the junctions at each end of the Albion-Broadmeadows line was transferred in 1963 to the CTC panel at Spencer Street. This panel also controlled the Standard Gauge line between West Footscray and Wodonga Loop. The signals on the SG line (1962/63) behave differently from those on the goods line and their working will be described in Section 6. That description will also cover the automatic signals in the Sunshine-Rockbank section (CTC from Sunshine - 1976).

Absolute Permissive Block with searchlight signals was installed between Bacchus Marsh and Ballan (1963) and between Moe and Morwell (1966) in conjunction with remote control of the intermediate loops (Bank Box Loop and Hernes Oak) from Bacchus Marsh and Morwell respectively. The Departure signals at Ballan and Moe are worked locally and the operating rules were those of the Automatic and Track Control system, not those of Centralised Traffic Control.

A rather unusual APB arrangement was provided on the Standard Gauge line between Wodonga and Albury in 1964 to take effect while the intermediate signal box at Wodonga Coal Sidings was switched out. Three-position searchlight signals were installed on both Broad and Standard Gauge lines between Coal Sidings and Albury (South Box) in 1962 and between Wodonga and Coal Sidings, together with the switching-out facilities, in 1964. The two short sections on both lines were worked under the Lever Locking and Track Control system in which each box controls the other's Departure signal. A diagram and description of the control arrangements is included in "Clear Normal Speed". Figure 11 is a simplified extract showing the signalling which applied on the Standard Gauge main line while Coal Sidings box was switched in. All signals on this line were homes, including Nos 14 and 57.

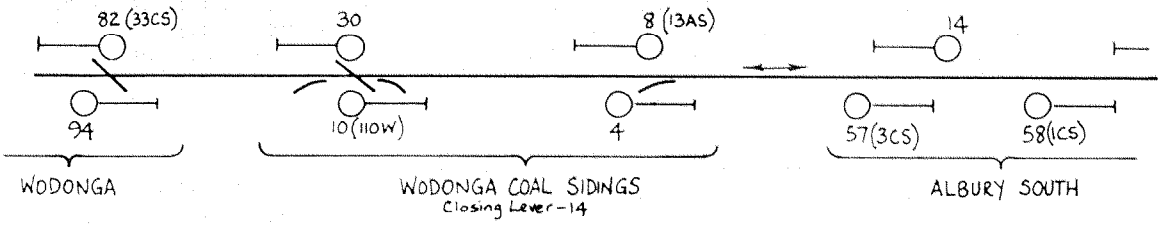

Figure 11.

While Coal Sidings box is switched out, control levers Nos 1, 3 and 33 are in the reverse position and control of Departure signal No 58 at Albury South is transferred to lever No 120 at Wodonga. Levers Nos 30, 10, 8 and 4 are also then reverse but only signals 30 and 4 work fully automatically; control of signals 10 and 8 is retained by the box ahead.

To allow Coal Sidings to be closed, the four signals shown there are equipped with directional stick relays and the usual APB "GR bridged by SR" contact arrangement - shown for example in Figure 8(f) - is included in the circuit of the preceding signals. These contacts are bridged by a further contact made when the closing lever is normal. Thus when Coal Sidings switches out, signals 82 (Wodonga) and 30 (Coal Sidings) in the Down direction, and 57 (Albury South) and 4 (Coal Sidings) in the Up are converted to APB signals Signals 30 and 4 are also then released by 10GR down or 8GR down, so that they clear when the Departure signal clears. Signals 10 and 8 are still released by the levers in the box ahead, but their controls are taken through 30SR down and 4SR down respectively, so that a lever signal cannot be cleared behind a receding train. As signal 8(13AS) and 58 are not APB signals, i.e. they are no

controlled through an SR up at the next signal when that signal is at Stop, it would appear that the APB system brought into effect when Coal Sidings switches out does not extend the whole way to Albury.

To complete this discourse on the signalling between Wodonga and Albury, it must be admitted that the dates of installation given in "Clear Normal Speed" and "Somersault", March 1979, are wrong. The dates for both the North-Eastern and Standard Gauge lines should read:

Wodonga-Coal Sidings (S)	1964 - May 10	(5)
Coal Sidings-Albury (S)	1962 - May 14	(5)

These were apparently inadvertently transposed and a slight mistake made even then. The 1962 date has been checked with a circular issued by the then Department of Railways, New South Wales, for bringing into use the new signal box at Albury South. The 1964 date is taken from the Items from Weekly Notices section of the "Divisional Diary", June 1964 - where abolition of Wodonga "B" box and replacement by a Control Panel in "A" Box was notified at the same time.

Wodonga Coal Sidings was not the first box in Australia where home signals could be converted to APB automatics by operation of a closing lever. This was done by the same method at interlocked stations on the Molong-Dubbo line in New South Wales where APB signalling was installed at its opening in the 1920's. The signals were battery-operated semaphores and it is believed that the cost of battery maintenance coupled with the failure of traffic to reach expected levels which led to the system's early abolition. The intermediate automatics were normally at Stop but the layout of signals (Figure 12) was different from that used in Victoria, although the arrangements adopted on the Standard Gauge line many years later were somewhat similar. Signals 3 and4

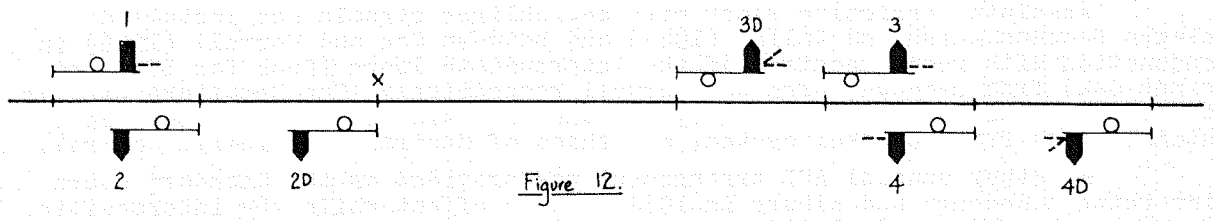

Figure 12.

were block signals and showed 0 deg and 90 deg only; signals 3D and 4D were Distants for 3 and 4, and operated in all three positions. Departure signal 1 also showed only 0 deg and 90 deg, and would not clear again until the van of a Down train had passed signal 4. Distant 3D also controlled as far as 4.

The intermediate signals were approach cleared, not by the Geelong line method but by straightforwad occupancy of track circuits. Thus signals 3 and 3D remained at Stop until a Down train passed 'x' when both went to 90 deg if signal 3's block was clear, or 3 remained at Stop and 3D went to 45 deg if 3's block was occupied. Signal 3's GR proved 4SR down, so 3 did not clear behind a receding Up train. An interesting and unusual feature of this form of approach clearing is that when signal 1 went to 90 deg, the next signal - 3D would be still at Stop. However, because both signals controlled to the same point (signal 4), a Driver had reason to expect that having passed signal 1 at 90 deg, signal 3D would be at least at 45 deg by the time he sighted it.

5.4 Electrified Suburban Lines

Three position automatic signalling was installed on a number of single lines in the Melbourne suburban area from 1958 onwards. The sections with the year of installation are listed below together with references to the operating rules applicable and issues of the ARHS "Divisional Diary" which give diagrams of the signalling. Lines where intermediate automatic signals are worked by a non-APB system are not included in the list but are mentioned later.

Eastmalvern-Mount Waverley	1958	(C)	DD Aug '64	Note 1
Syndal-Glen Waverley	1958	(C)	DD Jan '65	Note 1
Heidelberg-Tunnel Junction†	1958			Note 2
Hawthorn-Camberwell*	1963	(L)	DD Feb '64	Note 3
Camberwell-East Camberwell*	1964	(L)	DD Nov '64	Note 3
East Camberwell-Box Hill*	1971	(L)		Note 3
Burnley-Hawthorn*	1972	(L)		Note 3
Ferntree Gully-Belgrave	1964	(A)	DD Jul '64	Note 4
Altona Junction-Altona	1967	(A)	DD Jan '68	
Ringwood-Croydon	1973	(A)		
Ringwood-Bayswater	1974	(A)		

* - Centre line. † - near Rosanna.
Rules: A - Automatic and Track Control, C - Centralised Traffic Control, L - Lever Locking and Track Control.

Notes: 1. Points and signals at Mount Waverley, Syndal and Glen Waverley (electric switch lock release) controlled from 126 panel at Eastmalvern. System abolished with duplication 1964.

2. Part of Heidelberg yard. (See Somersault Nov 1981 for relevant diagram).

3. Final sections were Burnley-Camberwell-Box Hill.

4. Points and signals at Upwey and Belgrave controlled from panel at Upper Ferntree Gully. (Lower) Ferntree Gully also controlled 1977.

Of the sections listed, the most notable for its time was (in the writer's opinion) the Hawthorn-Camberwell Centre Line. This was signalled for a headway of two minutes for express trains travelling up to 72 Kmph (Trains are now allowed 80 Kmph - Ed.) and included seven automatics each way in a distance of a little over three kilometres. However the Camberwell-Box Hill Centre Line when completed in 1971 had eleven automatics each way. Moreover the existence of boom barrierscrossings at Surrey Hills and Mont Albert necessitated provision in each direction of separate outer and inner approach sections for express and stopping trains. Some other sections have only one automatic and Upper Ferntree Gully-Upwey has none.

On the lines listed, the automatic signals are normally at Stop and clear in succession when the Departure signal clears utilising the same principle as described for the Geelong line in Section 5.1. A slight modification is required in practice, however, because the signals are equipped with train stops and the stop arm must be lowered and proved down before the signal will clear. For this reason the partner's GR bottom contact is used to energise the train stop mechanism and drive the trip arm down rather than to control the signal direct.

Control levers are provided at boxes on the Centre Line; the lever acts directly on the Departure signal at the other end of the section and must be operated before the signal can be cleared by its own lever. The usual reason given for provision of control levers is that they enable the signalmen to regulate the traffic jointly without constant reference to the Train Controller. Another reason related to safety has, however, been put forward. It has been explained, with reference to Figure 7, that a Departure signal can be cleared only if all the opposing signals are at Stop. Clearing of signal 1 drops 4GR, which drops 6GR, which drops 8GR and so on back to the opposing Departure signals GR which drops and holds the signal at Stop, and at the same time extinguishes the "Track Clear" indicating light, or block light as it is sometimes known. There is thus an unguarded period between clearing of a Departure signal at one end and securing the signal at the other end at Stop.

If the signalmen did not confer on their intentions and B operated his signal lever an instant after A operated his and while the block light was still showing, then both signals might clear, but B's would remain off only until the cascade of GR's dropping reached it and put it back to Stop. The signal might show a mere flicker of Green or it might remain off for a second or so (the train stop would have to lower first). This condition is obviously undesirable and might be potentially dangerous. It could be prevented by providing a control lever at each end interlocked with the Departure signal lever in the same box. I do not know how much weight this argument carries, but it is evident that the more intermediate signals there are the more force it has. Provision of the control levers, of course, requires the running of two additional pairs of wires throughout the section.

Automatic signals on some lines are released by operation of a control lever rather than by clearing of the Departure signal. This is the non-APB system referred to earlier and is to be described in more detail in Section 7.

The diagrams in Figure 13 set out to show how the controls of a normally at Stop automatic searchlight signal with train stop can be derived from those of the basic APB normally clear semaphore illustrated in Figure 8 (c) and (d). Fig 13 (a) does not show the positions of the signal 'arms' because some of the diagrams refer to signals normally off and some to signals normally at Stop.

Figure 13 (b) shows the controls for a basic searchlight signal on a one-way line. The mechanism of a searchlight is in effect a three-position relay and may be controlled directly over a line circuit without need of an intervening relay. A signal may be designed for operation from 10 or 12 volts d.c. or 110 volts a.c. When the mechanism is de-energised the signal shows Red, when 'reverse' current (d.c.) or phase (a.c.) is applied the armature or vane moves to one side and the signal shows Yellow; when the current or phase changes to 'normal' the armature or vane swings to the other side and the signal shows Green.

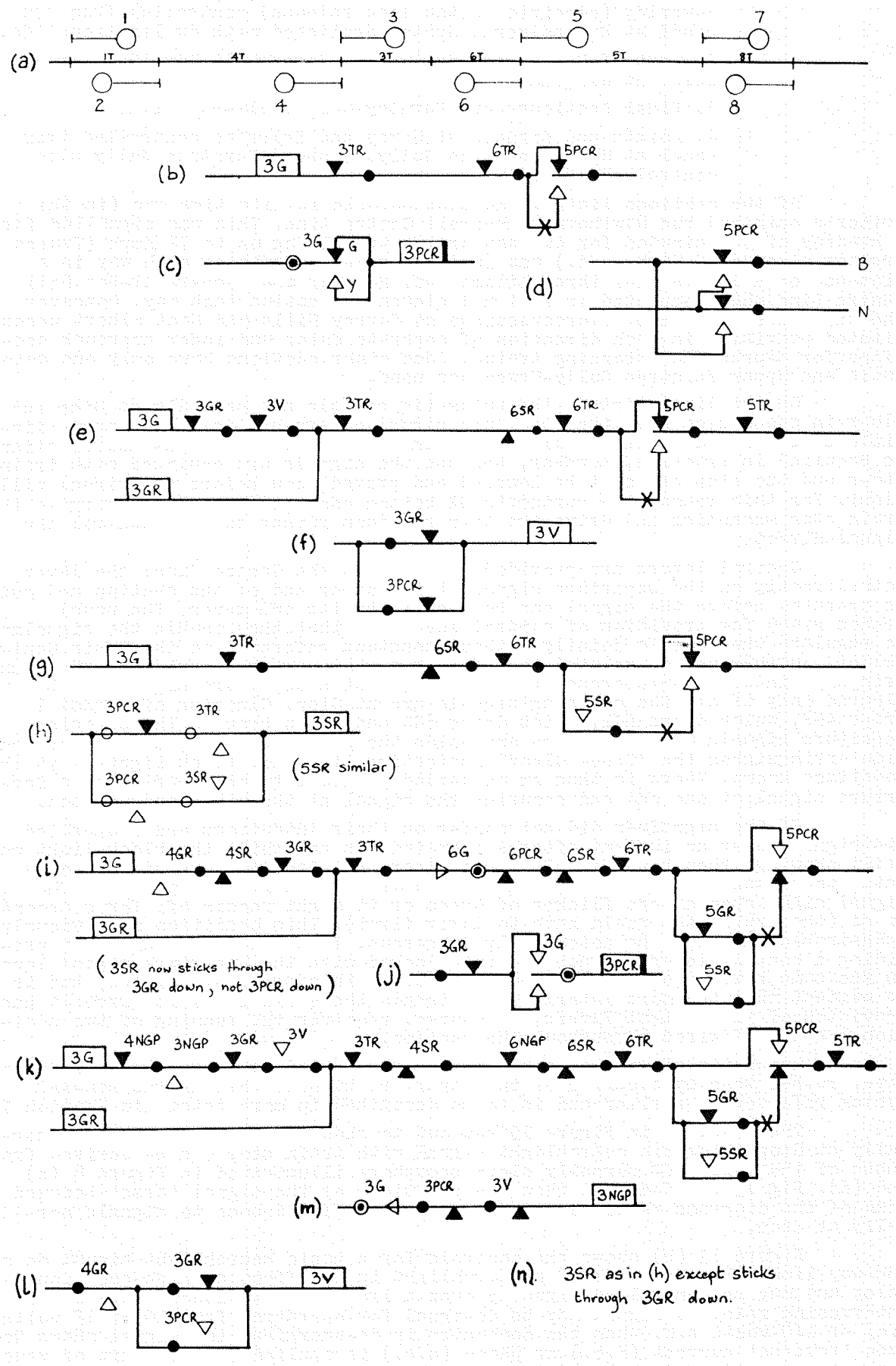
(a)
1
3
5
7
1T
4T
3T
6T
5T
8T
2
4
6
8
(b)
3G
3TR
6TR
5PCR
(c)
3G
G
Y
3PCR
(d)
5PCR
B
N
(e)
3G
3GR
3V
3TR
6SR
6TR
5PCR
5TR
3GR
(f)
3GR
3V
3PCR
(g)
3G
3TR
6SR
6TR
5PCR
5SR
(h)
3PCR
3TR
3SR
3PCR
3SR
(5SR similar)
(i)
3G
4GR
4SR
3GR
3TR
6G
6PCR
6SR
6TR
5PCR
5GR
3GR
5SR
(3SR now sticks through 3GR down, not 3PCR down)
(j)
3GR
3G
3PCR
(k)
3G
4NGP
3NGP
3GR
3V
3TR
4SR
6NGP
6SR
6TR
5PCR
5TR
5GR
3GR
5SR
(m)
3G
3PCR
3V
3NGP
(l)
4GR
3GR
3V
3PCR
(n). 3SR as in (h) except sticks through 3GR down.

Figure 13.

When Yellow or Green is displayed on signal 3, a pole changing relay 3PCR is energised through contacts in the mechanism 3G as shown in (c); the relay is made slow to release so that it stays up during the break while the signal changes from Yellow to Green. When 5.3R at the next signal ahead is operated, the pole changing connections in (b) are "normal"; when it is not operated the connections are "reverse" as indicated by the small 'x' in the lower path. This is of course merely a diagrammatic representation; the actual connections are more like those in (d) where both wires are shown.

Figure 13(e) shows the controls for a similar signal provided with a train stop 3V and overlap track circuit 5T. An additional relay 3GR is now required so that the stop can be lowered before the signal clears. The 3R is an ordinary two-position relay and so will drop momentarily while the polarised circuit it is branched across is being pole-changed. The contact 3PCR across the 3GR contact in the train stop controls in (f) ensures that the trip arm will not bob up while the signal changes from Yellow to Green.

Figure 13(g) shows how the basic signal in (b) is converted to a normally-clear APB signal for two-way lines. The directional stick relay 3SR in (h) picks up during the slow release time of 3PCR after the signal goes to Stop and sticks up through 3PCR down. The 5SR contact enables signal 3 to go to Yellow, and 3SR to drop out, after the van of a Down train passes signal 5. Signal 3 also proves 6SR down in accordance with the usual practice. This signal is thus the searchlight equivalent of the basic APB semaphore in Figures 8(c) and (d). The VR did not, however, have any searchlight signals as simple as this as far as I know.

Figure 13(i) shows how the signal in (g) is converted to one normally at Stop. Relay 3GR is again provided but it performs a different function from the one in (e) being required now for approach-clearing the partner signal 4G. The GR is normally operated and is subject to the same type of controls as 3GR in the normally Stop semaphore signal in Figure 8(f); the mechanism 3G is also subject to the same additional controls as 3G in Figure 8(g). Thus signal 3 clears when 4GR drops as a result of Departure signal 1 clearing, and is also held at Stop while an Up train recedes, and 4GR is down, by the operation of 4SR. The 5GR contact in the assembly on the right maintains continuity while signal 5 is at Stop and its PCR down; the 5PCR contact up prevents the 'flick' of 5GR when 5G circuit is pole-changed from being transmitted through to signals in the rear. In proving signal 6 st Stop it is not sufficient to prove 6PCR down because the relay might be faulty; a contact on 6G made when the mechanism is at Stop also has to be included. The type of signal described was used, for example, on the Albion-Broadmeadows line.

Figure 13(k) includes the additional controls necessary if the signal in (i) is provided with a train stop. Relay 3GR now also performs the functions shown in (e) and (f). When the signal has to be proved at Stop the train stop arm has also to be proved set to trip, and a new relay 3NGP (Normal siGnal rePeat) in (m) is provided, energised when 3G is at Stop, its PCR down and its trip arm set to trip. A signal which is to prove signal 3 at Stop now proves 3NGP up. In this scheme, signal 3 proves its partner signal 4 at Stop, as well as signal 6, and contacts of 4NGP and 6NGP are included. The 3NGP down contact ensures that this relay is working correctly before signal 3 can clear.

When Departure signal 1 clears and 4GR drops, energy is applied to the train stop mechanism 3V in (l) and the trip arm is driven clear. The 3V contact in (m) breaks and 3NGP drops whilst the other 3V contact in (k) makes when the trip arm is down and signal 3 now clears. Further action is similar to that of other APB signals except that an overlap is provided ahead of signal 5, and signal 3 cannot go to Yellow until the van passes signal 7. The 4SR contact has been moved into the combined 3G/3GR circuit so that while an Up train recedes from signal 3 and 4GR is down, the signal will not only be held at Stop but its train stop will also be set to trip.

A safety feature usually provided with searchlight signals on both one-way and two-way lines, but omitted from Figure 13 to avoid further complexity, is that if signal 5 wrongly stays off when the train passes, then signal 3 cannot clear again. This effect is achieved by making the overlap track relay e.g. 5TR in (e), a track stick relay 5TSR which remains down after the train passes clear unless signal 5 has returned to Stop. Where as in (b) and (i) there is no overlap, a 5TSR contact is still added on the right, but this is then bridged by contacts made by 5G and 5PCR normal. Thus in this case signal 3 can still clear again after the van passes signal 5 provided that signal 5 has returned to Stop.

(to be continued)

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SIGNALLING AND SAFEWORKING on the QUEENSCLIFF LINE

by Jack McLean.

Staff and ticket seems to have been used on the Geelong-Winchelsea section from its opening. In 1879, the mainline staff and ticket section Geelong-Moriac was divided at Queenscliff Junction, although on the branch the staff and ticket symbols are not shown until the WTT of 1/8/1881 when the sections were Queenscliff Junction-Drysdale-Queenscliff.

Queenscliff Junction must then have only been a pair of hand-worked points with home signals from each direction. On 23/7/1883, an interlocking frame was installed with nine levers, obviously one points, one lockbar, four home signals and three distant signals.

An early plan of South Geelong (before 1900) shows the platform where it is now with a loop opposite and a long dead end siding at the back facing up trains. In 1899, South Geelong had four signals, two of which were the starting signals used in connection with the Winter's Block installed in 1886. The sections were Geelong-South Geelong-Queenscliff Junction.

Although staff and ticket was replaced by large electric staff between Geelong, Queenscliff Junction and Mount Moriac on 29/3/1900, the Winter's Block was retained between Geelong and South Geelong in order that a train waiting for the required through road at Geelong could do so at South Geelong in preference to Queenscliff Junction.

Queenscliff Junction signalbox was closed on 5/8/1901 and the junction of the Queenscliff and Colac line was made at South Geelong by running the two lines parallel for about 1Km. South Geelong was made the electric staff station for the sections Geelong-South Geelong-Mount Moriac, and on the branch the staff and ticket section became South Geelong-Drysdale. The present 20 lever interlocking frame was installed at this time.

When Cheetham's siding was opened on 17/12/1909, the loop siding may have been shunted by the Queenscliff mixed but later when switch trips were required they would probably have been required when the mixed was beyond Drysdale and so the staff would have been at the wrong end of the section either for the switch trip or the returning mixed. Hence electric staff (at first large pattern) was announced in the Weekly Notice 29 of 1913. The change from large electric staff to miniature announced in Weekly Notice 29 of 1916 is curious as it preceded miniature electric staff on the main line by 12 years. The change may have been made to prevent the branch electric staff from being used (wrongly) to release the down end staff locked points at South Geelong, which had been there since 7/12/1914.

In February 1930, two composite electric staff were provided on the section South Geelong-Drysdale for which Leopold was a telephone block post, while on the Drysdale-Queenscliff section, Marcus could be opened for the same purpose.

The miniature electric staff was removed on 8/6/1931 and Drysdale was closed as a staff station. On the new staff and ticket section, South Geelong-Queenscliff, Drysdale was allowed to be a telephone block post. All of this telephone block working was probably caused by holiday excursion traffic running on short headways.

Most of the sidings were staff locked on 8/6/1898 and the remainder as they were opened. Drysdale had three plunger locks and Queenscliff two as from 18/2/1914, those at Drysdale being removed and replaced by staff locks on 19/12/1961. (There are certainly omissions and there may be errors in this brief account of the safeworking on the line and the writer would be pleased to hear of them. (Reprinted from Newsrail)

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EDITOR'S COMMENT

The big news of the year is that the I have had the eau-de-cologne installed and my number is (057) 962337. I will now sit by the phone and wait for the call that tells me to hold the presses because there is a big article on the way.

Speaking of articles and authors, the recent response to my plea for articles was tremendous and I would like to thank the following who sent material in for publishing, ... ??????????? .....
Let us see if we can do even better before the next issue in September.

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