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Maroona in Broad Gauge days looking north toward Ararat in January 1995. The Cressy line comes in from the right and the Portland line from the left. Maroona was opened with the line to Portland in 1877 and became a junction in 1913 when the line from Geelong via Cressy was opened. Sometime shortly after the Cressy line was opened the yard at Maroona was extensively enlarged; most of the relevant plunger locks were installed in 1915. It was intended to interlock the yard and a large signalbox was erected on the platform but never brought into use. The bracket post at the junction was provided in 1949 when the junction points were plunger locked. Like most locations Maroona was rationalised in the eighties and the back platform was removed in 1985. In 1987 the Ararat end plunger lock was removed when trailable points were installed. Maroona found itself on the interstate main line in 1995 when the Melbourne - Adelaide line was rerouted to run via Cressy and converted to Standard Gauge (the Portland line was converted at the same time). Section Authority working was provided on the Cressy line in 1996, but the section between Maroona and Pyrenees Loop continued to be worked by Train Staff and Ticket due to the lack of an interface between the CTC system in use on the Down side of Pyrenees Loop and the Section Authority System. The Section Authority System was extended to Pyrenees Loop in June 1998. Maroona, however, continued to be staffed for movements to and from the Portland line. On 22 May 2002 CTC working was extended from Pyrenees Loop to Maroona and the remaining mechanical signalling at Maroona was abolished.

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MINUTES OF MEETING HELD FRIDAY MAY 17, 2002,

AT THE SURREY HILLS NEIGHBOURHOOD CENTRE, 1 BEDFORD AVENUE, SURREY HILLS

Present: - J.Black, W.Brook, G.Candy, G.Cleak, R.Cropley, B.Crosby, G.Cumming, C.Gordon, A.Gostling, M.Guiney, K.Lambert, D.Langley, S.Malpass, B.McCurry, J.McLean, I.Michaelson, C.Rutledge, L.Savage, B.Sherry, P.Silva, R.Smith, A.Waugh, R.Weiss, A.Wheatland & R.Whitehead.

Apologies: - I.Chan, B.Cleak, A.Hinde, W.Johnston, & G.O'Flynn.

Visitors: - V.Findlay, J.Gordon & J.Hersch.

The President, Mr. David Langley, took the chair & opened the meeting @ 19:36 hours.

Syllabus Item: - The President introduced visitor John Hensch to present the Syllabus Item.

John addressed the meeting on the subject of the Gauge Standardisation Project in Victoria.

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

Intermission 21:27 – 21:47.

Minutes of the March 2002 Meeting: - Accepted as published. W.Brook / G.Cleak. Carried.

Business Arising: - Tom Murray should be shown as an attendee at the March 2002 Meeting.

Correspondence: - The Annual Return was sent to the Office of Business Affairs.

Payment for the U.K. Signalling Record was sent to the S.R.S.U.K.

R.Smith / S.Malpass. Carried.

Reports: - Tours. Glenn Cumming advised the meeting of the proposed arrangements for the Signal Box Tour to be held on Monday 23 September 2002. Any comments or questions are to be directed to Glenn Cumming.

General Business: - Ross Cropley tabled a photograph of boom barriers in service at Lydiard Street level crossing, Ballarat. The "doctored" picture was appreciated by all present.

Keith Lambert advised that the commissioning of the new signals between Jolimont & Victoria Park is scheduled for Sunday 23 June 2002.

Keith Lambert also noted that the new signalling at Maroona is being commissioned this weekend.

Colin Rutledge discussed some aspects of the Maroona – Pyrenees Loop project. The diagram for Maroona shows Automatic Signals on the approaches to Maroona but Repeating Signals have been installed. Not all distances have been shown on the diagram. Colin explained the reasons behind the change from Automatic Signals to Repeating Signals including the use of two signal protection & overlaps.

Keith Lambert reported that in February 2002, the remote control of Clifton Hill from Metrol failed & the local control panel at Clifton Hill was used during the afternoon peak.

Keith Lambert noted that in 1967, when Hawthorn switched out, Down trains could use either the Down Line or the Centre Line & Keith wanted to know why this facility was provided? The reasons for this were discussed.

Graeme Cleak reported that single line working would be in force between Broadmeadows – Somerton on the Down Line next weekend to allow platform work at Broadmeadows. A pit upgrade for Strathmore is also scheduled for the same weekend.

Laurie Savage reported that electric locks & Repeating Signals were awaiting commissioning at Inverleigh.

Colin Rutledge outlined the various proposals for signalling the new connections at Castlemaine & Maldon Junction for the Castlemaine & Maldon Railway.

Andrew Wheatland reported that as from Wednesday 1 May 2002, Menzies Creek was made a staff station for all trains and the long section staff & ticket boxes were withdrawn. Work continues on the rebuilding of the intermediate crossover & the provision of a two-lever ground frame at Belgrave.

Andrew Wheatland noted that signalling alterations from Puffing Billy were now being published in Somersault & Andrew wished to thank Andrew Waugh for his efforts in this matter.

Rod Smith spoke about the recent alterations at Eaglehawk & Inglewood & asked why ?

Colin Rutledge answered that all mechanical equipment had been replaced by electronic equipment including jointless track circuits & time releases.

Colin Rutledge described the arrangements at Birchip Grain Loop. The mainline points are secured by Master Key Lock & point clip. An Operations Officer is required to attend whenever a train uses the siding. A proposal for revised point locking arrangements has been seen. Other new grain sidings are under construction at Charlton & Woorinen.

Glenn Cumming asked why electric locks were now preferred over switch locks. Colin Rutledge replied that switch locks are no longer manufactured. Electric locks use standard components used by other equipment & a simple case.

Tom Murray advised that the Broken Hill Xplorer service commences on Monday 24 June 2002 & a single XP loco has run between Orange - Broken Hill for crew training.

Tom Murray spoke about arrangements at the new sidings for grain loaders at Sealake & Woorinen.

Tom Murray asked what is DICE ? The answer is Driver Initiated Control Equipment.

Tom Murray also reported on a fire at the Geelong RRR this morning.

Vance Findlay asked if Camberwell would go to remote control from Metrol when it is re - signalled ? The answer was not known.

Andrew Gostling advised that the new Train Management Facility (TMF) is now scheduled for completion in June 2003.

Bob Whitehead spoke about arrangements at Daylesford where livestock was loaded in the staff section on the Carlsruhe Line. These arrangements lasted until 1924 when the new Livestock Siding was provided.

Bob Whitehead spoke about the facilities on the Alberton Line for Mason & Sons Siding provided for a sawmill on the down side of Toora. A platform was provided on the mainline at the site of the siding. The siding had gone by 1989 & is believed to have existed between 1891 - 1898.

David Langley reported on the donation to the SRSV of a large amount of documentation from the A.R.E. It was agreed that the Secretary should write to the Committee of the A.R.E. to thank them for the donation.

David Langley reported on the donation to the SRSV of a large number of diagrams from John Hearsch. It was agreed that the Secretary should write to John to thank him for the donation.

Rod Smith spoke about the Echuca Wharf Line & asked when it would open / The answer was not known at the time.

Graeme Cleak spoke about the accident at Potters Bar in the U.K. A lengthy discussion ensued regarding the circumstances surrounding this accident.

Ross Cropley asked about the signal post numbers at Ringwood. Keith Lambert & Colin Rutledge provided an explanation.

Meeting closed @ 22:51 hours.

The next meeting will be on Friday 19 July 2002 at the Surrey Hills Neighbourhood Centre, 1 Bedford Street, Surrey Hills, commencing at 20:00 hours (8.00pm).

SIGNALLING ALTERATIONS

The following alterations were published in WN 13/02 to WN 21/02 and ETRB A circulars. The alterations have been edited to conserve space. Dates in parenthesis are the dates of publication, which may not be the date of the alteration.

- (09.04.2002) **Carrum** (SW 31/02, WN 13/02)
 Commencing forthwith, the signalbox hours will be:
 Monday - Friday 0450 - 0730 hours and 1740 - 2035 hours
 Saturday, Sunday Closed
- 10.04.2002 **Camberwell** (SW 509/02, WN 16/02)
 On Wednesday, 10.4., the trial purple LED in Dwarf 24 (exit from A siding) was replaced by a purple incandescent light.
- 14.04.2002 **West Richmond** (SW 510/02, WN 15/02)
 On Sunday, 14.4., Automatic S75 was relocated 15 metres in the Down direction. Amend Diagram 13/92.
- 14.04.2002 **Seaford** (SW 33/02, WN 13/02)
 On Sunday, 14.5., the WRRS boom mechanisms at Armstrongs Road were replaced by S-40 mechanisms.

- 19.04.2002 **Shepparton** (SW 1041/02, WN 14/02)
 On Friday, 19.4., the existing hand operated derail in No 6 Road was relocated 58 metres in the Up direction. Two hand operated derails were also provided on each side of the loading on No 5 Roadshed; there is 42 metres between the two derails. Signs lettered 'Derail' will be provided at all three derails.
 Prior to loading or unloading operations being carried out, the Supervisor must advise the Signaller that the Derail blocks are to be applied. The Derail blocks must then be locked on the rail. The Supervisor must retain possession of the key to the padlocks. When operations are completed the Derails must be locked off the rails and inform the Signaller. Changes in the position of the Derails must be recorded in the TRB.
 Amend Diagram 6/88.
- 21.04.2002 **Carrum** (SW 34/02, WN 14/02)
 On Sunday, 21.4., the WRRS boom mechanisms at Beach Street will be replaced by S-40 mechanisms.
- 21.04.2002 **Book of Rules, Rule 1, Section 3 (Detention at Automatic Signal)** (SW 505/02, SW 1009/02, SW 05/02, WN 15/02)
 From 0001 hours, Sunday, 21.4., the current Rule 1, Section 3, has been amended as follows. This amendment only applies to the Victorian intrastate network. If it is necessary to pass an Automatic signal at Stop on the ARTC interstate corridors, the Driver must confer with the ARTC Train Controller.
Automatic Signal at Stop.
 1) After bringing the train to a stand at the signal the Driver must wait for 30 seconds. If the Automatic signal is still at Stop after this time the Driver may proceed, but must control the speed of the train at extreme caution being prepared to find the section ahead occupied or obstructed, or the track damaged. Extreme caution is defined as a speed at which it is capable of stopping within half the distance visible ahead, but not exceeding 25 km/h or the posted track speed. Except where special instructions are issued to the contrary, or where a disabled train requires assistance, a Driver must not pass any signal when it is known that there is a train in the section ahead.
 2) The Driver must not
 * pass the signal if the line ahead is known to be occupied until the train ahead moves out of sight or out of the track section.
 * assume that the signal is defective, but must always assume the track ahead is occupied, obstructed, or damaged.
 * be distracted while the train is in motion. The Driver must bring the train to a stand before performing any other task.
 * pass the signal unless the Driver can exercise full control of the train.
 3) The Driver does not have to pass the signal at Stop if they consider it unsafe. This may be because of: the braking ability of the train with respect to the gradient; defective or isolated equipment; extremely bad weather conditions; poor or restricted visibility; or fog. The Driver must advise the Train Controller of the circumstances for not proceeding.
 4a) At no time is a Signaller, Train Controller, or other person permitted to indicate to a Driver that an Automatic signal is defective when it is at Stop.
 b) **Next Automatic Signal.** Should the next signal in advance be at Proceed, the Driver must still be prepared to stop short of any obstruction. The speed of the train must not be increased until the whole of the train has cleared the next signal.
 c) **Parallel Lines.** Where there are parallel lines and the Driver sees a train in advance, the Driver must bring the train to a stand until it has been determined that the train in advance is on a parallel line.
 d) **Two Trains in the Section.** If, after entering the section, the Driver sees a train on the track, the train must be brought to a stand and wait until the first train has proceeded on its journey unless the Driver is authorised by the Train Crew of the first train to move cautiously forward. After the first train has proceeded, the second train may also proceed at a sufficient distance to avoid colliding with the first train in the event of its stopping. The Driver must bring the train to a stand at the next signal if it is at Stop. Radios should be used for communication between Drivers. If radios are unavailable hand signals must be used.
 e) **Next Automatic Signal.** If the next signal is an Automatic signal and is at Stop the procedures in this rule apply at that signal.
 f) **Active Level Crossings.** Where a level crossing equipped with boom barriers or flashing lights is in the track section and the equipment is not working, the Driver must move cautiously forward until the level crossing protection equipment is operated by the train. The train must not proceed over the level crossing until the level crossing protection equipment is operating and it is safe to do so. The Driver must use the whistle frequently.
 g) **Two Position Automatic Signals protecting a Level Crossing.** Where the Automatic signal protects a level crossing equipped with boom barriers or flashing lights in a Train Order, Section Authority, Staff, or Double Line Block section and the signal is at Stop, the Driver must bring the train to a stand for 30 seconds. The Driver may then move cautiously forward until the boom barriers or flashing lights are operated. The train must not proceed over the level crossing until the level crossing protection equipment is operating and it is safe to do so. The Driver must use the whistle frequently. The Driver may then resume normal speed after passing over the level crossing.
- (23.04.2002) **Newport Workshops** (SW 38/02, WN 15/02)
 No 1 Stabling Road has been extended by 338 metres (its length is now 690 metres) and a turnout provided between No 1 and No 2 Roads.

- 28.04.2002 **Belgrave - Gembrook** (A15/02)
 On this day (the Great Train Race) between 0800 hours and the arrival of L958 a Traffic Controller was appointed to control all train and trolley movements. During this time The Traffic Controller will be located at the Safeworking Officer, Belgrave.
 The Train Controller is responsible for issuing the Belgrave - Menzies Creek Train Staff or Ticket at Belgrave unless the Controller directs otherwise. No Guard or Signalman may issue any Train Staff or Ticket at any other location except under the instructions of the Train Controller. All safeworking messages are to be passed to the Train Controller and not to the station in the rear as is normal practice. The Train Controller will pass on all necessary messages and clearance to depart at the same time.
 The arrival and departure of all trains must be reported to the Train Controller by the Signalman (or Guard at stations where a Signalman is not on duty). Guards must report any stoppages in the section immediately and again when the train is moving again.
 All Safeworkers must ensure that their watches are on Belgrave time.
- 01.05.2002 **Menzies Creek** (Amendment to WTT & A 18/02)
 Commencing forthwith, Menzies Creek is a permanent Staff station. The Belgrave - Lakeside Staff and Ticket Boxes are in the custody of the Signal Supervisor.
 From Wednesday, 1.5., No 11 Down Passenger (Timetable B) is to be routed via No 1 Road to allow any excess carriages to be detached and left for No 28 Up Passenger to pick up. The carriages are to be left in No 1 Road. Before the departure of No 11, the Guard is to set the Up end of the yard for the arrival of No 17 Pass into No 2 Road. The Down end will be left set for No 1 Road, but the Up Home will be secured at Stop. Nos 17 and 24 Pass' are to operate via No 2 Road. No 28 Pass is to arrive into No 2 Road and the engine will cut off and pick up the carriages. The Track Patroller will ensure that the road and signals are set for the arrival of the first Down train into No 1 Road.
- 03.05.2002 **Broadmeadows** (SW 42/02, WN 16/02)
 On Friday, 3.5., a purple LED was installed as a trial in Dwarf BMS 515.
- 05.05.2002 **Dandenong** (SW 41/02, WN 16/02)
 On Sunday, 5.5., Signals DNG 702 and DNG 704 were converted to Westinghouse RX8 210mm LED units.
- 07.05.2002 **Traralgon** (SW 1045/02, WN 17/02)
 On Tuesday, 7.5., a Notice Board lettered "Trains must not proceed past this point until directed by the Signaller" (black text on white background) was provided adjacent to the 158 km post on the platform in No 3 Track facing the Up direction. The board is to prevent a train from coming to a stand between the Board and the Derail located at the Up end of No 3 Track. Amend Diagram 22/97.
- 10.05.2002 **Kensington - Essendon** (SW 47/02, WN 17/02)
 Between 0030 and 0430 hours each day between Wednesday, 8.5., and Friday, 10.5., the existing GRS train stops will be replaced by JAE mechanisms.
- 11.05.2002 **Belgrave** (A 19/02)
 On Saturday, 11.5., the small point lever operating the intermediate crossover in No 1 Road was replaced by a two lever ground frame. Lever 1 works the points. Lever 2 is secured in the reverse position by an S1 padlock and must be placed normal to reverse Lever 1. The main line points remained secured by the Annett lock at the toe of the points.
- 11.05.2002 **Dandenong** (SW 48/02, WN 17/02)
 After the passage of the last train on Saturday, 11.5., Compound Points 612 will be converted to claw locks.
- 12.05.2002 **Cheltenham** (SW 46/02, WN 17/02)
 On Sunday, 12.5., the WRRS boom mechanisms at Park Road were replaced by S-40 mechanisms.
- 19.05.2002 **Seaford** (SW 40/02 & 43/02, WN 16/02 & 17/02)
 On Sunday, 19.5., the WRRS boom mechanisms at Station Street were replaced by S-40 mechanisms.
- 22.05.2002 **Maroona - Pyrenees Loop** (SW 1048/02 & 1051/02, WN 18/02 & 20/02)
 On Wednesday, 22.5., CTC will be commissioned between Maroona and Pyrenees Loop.
 The existing two position signalling at Maroona was replaced by three position signalling. Homes A, E, F, G, K, L, P and Q were abolished. The signal levers, 5P key switches, and push buttons were abolished. The Maroona Block Point and associated signs were abolished.
 At Ararat Down Repeating signal A2115 was altered to an Automatic signal and renumbered V2635. Down Home A2117 was altered to an Automatic signal. The signals will display Stop, Normal Speed Warning, and Clear Normal Speed. The 'Commence' and 'End Section Authority Territory' Boards at the Down and Up ends of the goods yard will be replaced by 'Start' and 'End' CTC boards.
 Diagrams 4/02 (Maroona Loop) and 6/02 (Ararat) will replace 6/00 and 6/90.
 The instructions relating to Maroona in SW 1174/99 and Ararat in SW 1017/01 are to be cancelled and the following procedures inserted in Section 34 of the Book of Rules.
- 81. Maroona.**
 a) **General.** The points and signals are operated by ARTC Train Control in Adelaide. Maroona is a Train Order Terminal station for movements towards Portland and a Section Authority Terminal station for movements towards Melbourne. Centralised Traffic Control is in force between Maroona and Pyrenees.

All movements will use Channel 2 of the Train to Base radio.

b) **Issue of Train Orders to Portland line.** Movements to the Portland line will come to a stand at Maroona to receive a Train Order from Centrol, except that if a train for Portland is standing at Pyrenees or Ararat the Train Order may be issued to the train at that location *provided that there are no movements or Train Orders issued between Maroona and Glen Thompson.* Train Orders issued at Pyrenees or Ararat must start with 'Proceed from Maroona to ...'. The ARTC Train Controller must not clear a signal for a movement to the Portland line until advised by the Centrol Train Controller that a Train Order has been issued for the train. The Driver must not proceed past signals 244/10 or 244/12 unless in possession of a Train Order.

c) **Issue of Section Authorities to Melbourne Line.** Prior to arriving at Maroona from Pyrenees, Drivers must change to 1200 mode, conduct a Text Test, and request a Section Authority for the forward section. The ARTC Train Controller must not clear a signal for a movement to the Melbourne line until advised by the Train Controller that a Section Authority has been issued for the train. The Driver must not proceed past signals 244/10 or 244/12 unless in possession of a Section Authority.

d) **Point Stand Indications.** The points to the Goods Siding (No 3 Track) at each end of the yard are equipped with T21 point machines and point stand indicators. The indicators will display a yellow circle when the points are set for the loop line and a white square when the points are set for the Goods Siding. Should the Driver of an approaching train observe a white square, the train must be brought to a stand, the Train Controller advised, and the points checked to ensure that they are set and secure for the movement.

e) **Goods Siding Point Locking.** V5PSW key switches are provided adjacent to the Goods Siding points at each end of the yard to electrically release the lock on the point machines. The release is given by the ARTC Train Controller. The key switches have three positions: Cancel (cancel the release); Centre (key release); and Accept (accept the release). Three indicator lights are provided: Points Locked; Release Available (release offered by Train Controller); Points Free (release accepted).

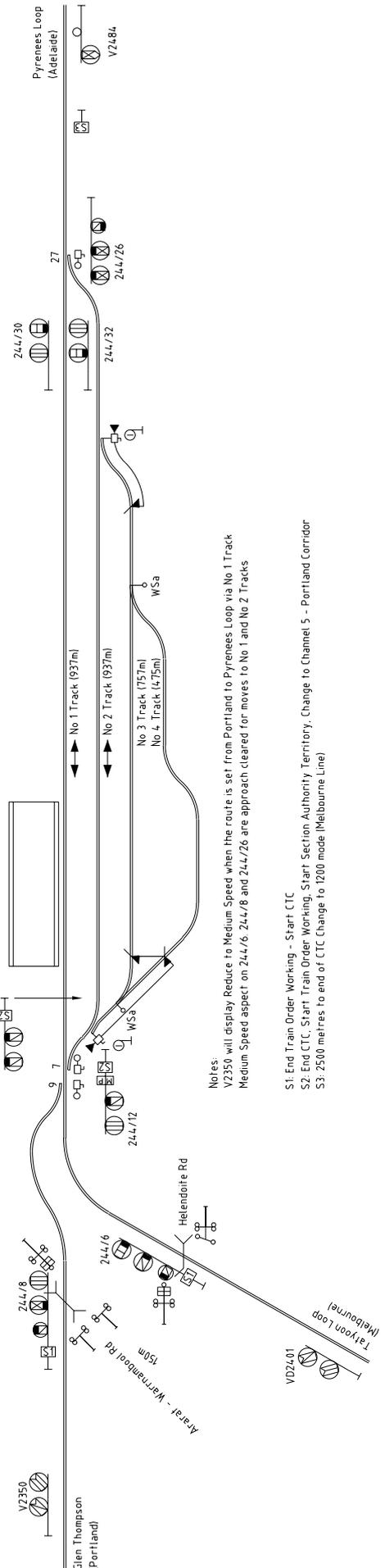
f) **Location of Derails.** A rodded Hayes Derail and Wheel Crowder is provided at both ends of the Goods Siding.

g) **Train Operation at Maroona Goods Siding.** Prior to a movement requiring to shunt at Maroona arriving at Maroona, the Train Crew must confirm with the Freight Australia Train Controller that the movement is authorised to work within the yard at Maroona. The ARTC Train Controller must be advised accordingly. The Driver must bring the movement to a stand at the points and request a release from the Train Controller. When the 'Release Available' light is displayed, the V5PSW must be inserted and turned to the 'Accept' position. When the 'Points Free' indication is displayed the key is to be restored to the centre position and withdrawn. The hand throw lever of the T21 point machine will then be unlocked and the points reversed. Immediately the movement is clear of the points they are to be restored to normal and the hand throw lever locked. The V5PSW key will be inserted in the key switch and turned to the 'Cancel' position and the ARTC Train Controller notified.

h) **Medium Speed Warning indications on Signals 244/10 and 244/12.** When the Medium Speed Warning indication is displayed on Up Home Departure signals 244/10 and 244/12 the speed restriction will only apply

Maroona 2002

(Based on Chris Gordon's diagram, site visit, and WN 20/02)



until the whole of the movement has cleared the points. The train may then resume normal track speed.

i) **Signal or Point Failure.** Should Up Home Departure Signals 244/10 or 244/12 fail at Stop for movements to the Melbourne or Portland lines, the Train Controller will issue a Signallers Caution Order after confirming that the appropriate authority has been issued to enter the section. The Driver will not be required to record the details of the Caution Order, but the Driver and Train Controller will exchange names.

Should the points also fail, or positive detection is not available on the points, the Train Controller will instruct the Driver to set the points in the Hand Operating Position and operate the points to the required position before authorising the movement to pass the signal.

All other signals will be treated in accordance with the rules of the Centralised Traffic Control System.

82. Ararat

a) **General.** Ararat is the junction for the Freight Australia line to Maryborough. The junction is at the Down end of the yard and the lead is provided with a Derail and Wheel Crowder. A crossover is provided at the Up end of the yard between the main line and the Maryborough line. Goods Sidings are located on the Maryborough line.

b) **Terminology.** The main line is No 1 Track, the Maryborough line is No 2 Track, and there are two Goods Sidings: the Freight Gate siding and the Engineers Siding.

c) **Signage.** In addition to the existing Notice Boards, the following boards have been provided. Notice Boards lettered 'Start CTC' and 'End CTC' (black letters on red ground) have been provided at the fouling points of the main line connections at the Up and Down ends of the yard. A Stop board lettered 'Stop. Obtain Authority from Freight Australia Train Controller before Proceeding' is provided at 273.300 km on the Maryborough line.

d) **Point Stand Indicators.** The main line points are equipped with Type ST21 point machines and point stand indicators. The indicators display a green arrow if the points are set for the main line, and two red discs if the points are set for the Maryborough line. Should a Driver of a main line movement observe the point stand indicator displaying two red discs, the train must be brought to a stand at the points, the Train Controller notified, and the points checked to ensure that they are set and secure for the main line.

e) **Main Line Point Locking.** The main line points are secured by electric locks released by the ARTC Train Controller. V5PSW key switches are provided at each set of points to release the locks. The key switches have three positions: Cancel, Centre, and Accept. Three indicator lights are provided: Points Lockes, Release Available; and Points Free. An 18 metre track circuit is provided in advance of each set of main line points and this track circuit has to be occupied for the release to be granted.

f) **Derails.** A rodded Hayes Derail and Wheel Crowder is provided on the lead from the Maryborough line at the Down end. Hand operated Derails are provided at the Down end of the Freight Gate siding and the Engineer's Siding. A rodded Derail is provided at the Up end of the Freight Gate siding. The points to the Goods Sidings are secured by Hand Locking Bars and padlocks.

g) **Train Operation Pyrenees or Maroona to Maryborough.** Prior to departing from Pyrenees or Maroona, the Train Crew will confirm with the Freight Australia Train Controller that the movement can enter the Ararat yard and the ARTC Train Controller advised accordingly. This is to ensure that no main line trains are delayed and that there are no movements from the Maryborough line occupying Ararat yard. The Driver will bring the train to a stand within 18 metres of the facing points at Ararat and request a release from the ARTC Train Controller. After observing that the 'Release Available' indication is displayed, the Driver will insert a V5PSW key and turn it to the Accept position. Once the 'Points Free' light is displayed the key will be returned to the Centre position and withdrawn. The Hand Throw lever on the point machine will then be unlocked and the points reversed. Once the movement is clear of the main line the points are to be restored to normal and the hand throw lever locked. The Driver will then insert the V5PSW key and turn it to the Cancel position and advise the Train Controller. After the movement has obtained the Train Staff for the Ararat - Maryborough section and the approval of the Freight Australia Train Controller it may depart.

h) **Train Operations from Maryborough.** The train will come to a stand at the Stop board at 273.300 km and obtain permission to enter Ararat from the Freight Australia Train Controller. The Train Staff is to be handled in accordance with the instructions of the Freight Australia Train Controller. If the train is to continue on the ARTC main line the main line points will be worked as described clause g).

i) **Main line Trains shunting Ararat.** Should a main line train be required to shunt Ararat, the procedures of clauses g) and h) will be followed, including obtaining permission from the Freight Australia Train Controller before departing Maroona or Pyrenees.

j) **Failure of Electric Release Locks.** If the release fails a Signal Maintenance Technician will be contacted and requested to attend to provide the release.

k) **Track Machines.** Track machines will be worked in the same manner as trains. Operators of Track Machines stabled in Ararat yard must ensure that the points leading to the Engineer's Siding are locked normal and the Derail locked on immediately after use. The Freight Australia Train Controller must be advised when the Track Machines have been stabled. The points are not to be reversed for a Track Machine to enter the running lines unless the Freight Australia Train Controller has granted permission.

l) **Ararat - Maryborough Train Staff.** The Train Staff for the section is normally kept at Maryborough. The Train Staff may be transferred by road to and from Ararat by the Train Crew under the following proce-

PRE INTERLOCKING IRON SEMAPHORES OF THE VR

An article on semaphore masts was published in the December 2001 issue of Somersault. Of the masts described the most obscure were a variety of iron masts installed between 1873 and 1881. Colin Rutledge has kindly made available some drawings from his extensive collection to provide some insight into these fascinating signals.

Contract 450

Contract 450 was let to David Edwards for the supply of "Semaphores" on the NE line. Edwards signed the contract on 9 September 1872 (a indication of the timescales of contracting may be gained by the fact that Edwards tendered for the job on 30 August 1872, and the contract was gazetted on 20 September). The contract was for £2,407/16/0, a large value which suggests that it was for all of the semaphores on that line.

The contract drawings are on two sheets headed 'North Eastern Line 30 ft Semaphore. One sheet gives the general arrangement of the signal, the second gives the detail parts. The general arrangement lithograph is dated March 1872.

The broad design of the semaphore was similar to contemporary British wooden posts with the semaphore arm working in three positions in a slot at the top of the post. The lamp was located below the arm, just below the bottom of the slot. The lamp and spectacle plate were mounted on a carriage which could be lowered by a winch to allow servicing at ground level. The semaphore and spectacle were worked from an operating lever mounted on the post, however the details drawing includes a "Lever for Distant semaphore" indicating that some of the signals were operated by wire or chain. The most curious feature of the semaphore is that the arm is to the right of the post. Incidentally, the drawing only shows a single arm, and the amount of equipment at the foot of the post suggests that double arm signals (with one arm for each direction) were not possible.

Turning to details, the semaphore mast was a hollow wrought iron tube made from 3/16" plate. It tapered from 10" in diameter at the finial to 14" diameter at the base. The slot at the top of the mast was some 7" in length. A finial was mounted on the top of the post, mainly for decorative purposes but also to give strength to the top of the slot, and the total height of the post from ground level to the base of the finial was 30'.

Embedding a wrought iron tube in the ground would have been an invitation to rust, and the mast was stepped in a socket in a cast iron sole plate. The turning moment of the mast was resisted by the 3' arms of the sole plate which were strengthened by deep ribs. The sole plate was tied to a massive brick and concrete block 6' square and 3' deep by wrought iron tie bars at the end of each cross arm.

The signal blade was metal and was 5'7" long from the pivot. It tapered from 9" in width at the pivot to 10" at the end of the arm. The construction of the blade was unusual to modern eyes. It was made of two sheets of 1/16" plate and to give strength to the arm, each sheet was dished and the two sheets rivetted together to give something like a aircraft wing. The arm was 1" thick at the pivot, and this tapered to nothing at the end of the arm. Three rows of holes were drilled in the arm to reduce the wind pressure. These holes would have allowed water into the arm and lead to rusting of the bottom of the arm. There is no indication on the drawings of the colour the arm was painted.

The blade was operated by a lever at the base of the post. The lever was 24" from pivot point to handle and operated in a sector mounted on the post. Three catches were provided on the sector and it appears that enough slop was

provided in the lever bearings to allow the lever to be caught in any of these catches. The operating lever and the arm was connected by a connecting rod which operated inside the post. This connecting rod was a complex piece of work and was made up of five pieces pinned together. At the bottom end of the connecting rod there was a cast iron counterbalance weight which would have ensured that the semaphore arm returned to danger - provided none of the pins fell out. The drawing notes that the length of the cast iron weight is 'to be determined by experiment (probable length 12")'

The lamp was mounted on a carriage which ran on a rail fixed to the outside of the mast. The winch used to raise and lower the carriage was mounted inside the foot of the mast. The cast iron winch drum was 7 3/4" in diameter and 4" wide. It was operated by a crank handle on the side of the mast. A ratchet and pawl was provided on the winch to hold the carriage in position at the top of the mast. A 9 3/4" diameter pulley was mounted at the top of the mast, at the base of the slot, to reverse the direction of the chain or wire rope connecting the winch drum and the lamp carriage.

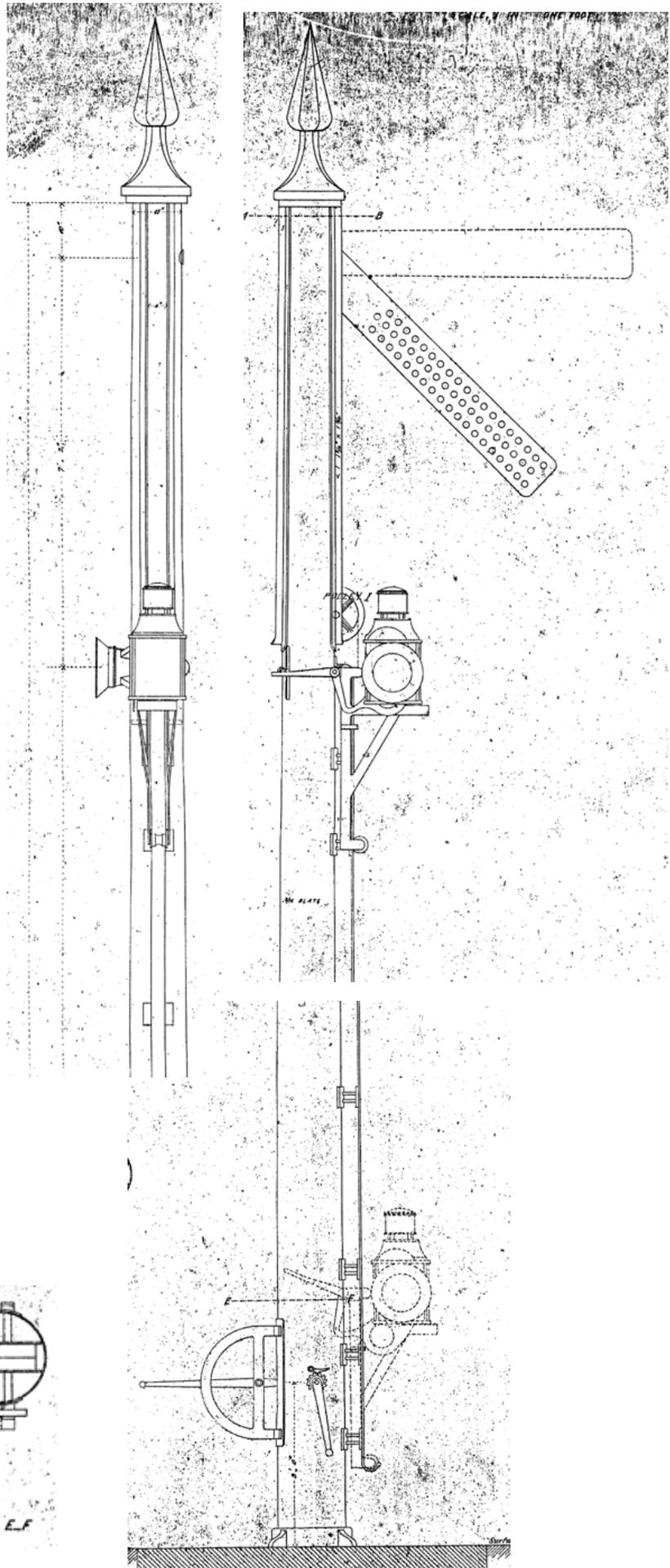
The lamp spectacle had two 5 1/2" diameter circular lenses, one red and one green. As was usual with this type of semaphore, the spectacle was lowered completely to allow the lamp to show white for clear. The spectacle was mounted on the lamp carriage and so was lowered and raised with the lamp. It was consequently not possible to have a fixed connection to the operating rod. Instead, an arm on the spectacle engaged with a stud on the operating rod when the lamp carriage was at the top of the mast. To modern eyes there are a number of problems with this arrangement. First the mechanism only works if the lamp carriage is completely raised. Second, if anything breaks the weight of the spectacle plate will cause the lamp to show clear. Finally, and most importantly, as soon as the lamp carriage is lowered from its operating position, the spectacle plate will drop and show a clear light.

The major, and obvious, flaw with this design of semaphore mast was that it was impossible to maintain. Indeed, it is difficult to think of ways in which the design could be improved upon if the goal was to make something that would fail after a short time. All of the mechanism - including the winch - was mounted inside the mast with no means of access - except to water which had free entry via the large slot for the arm at the top of the mast and no exit at the base. No provision was made for access to the top of the mast to maintain the arm or mechanism. Heaven help the poor signal fitter if the lamp carriage got stuck at the top of mast or the arm bent in the wind!

Contract 507

Contract 507 was let to Thomas Tozer on 4 August 1873 (The drawings were prepared in July 1873, Tozer submitted his tender on 25 July 1873, and the contract was gazetted on 8 August 1873). Two contracts were, in fact, gazetted on that day to Thomas Tozer and I am not sure which was actually Contract 507. The first contract, for £800/0/0 was for the 'erection of semaphores at various stations'. The second was for the erection of semaphores and was charged to 32 Vict 331, schedule 2, item 1. This second contract was originally for £1315/0/0, but was subsequently increased by £510/9/5 on 28 May 1874. The total for both contracts was for over £2600, and thus can be assumed to for a significant number of semaphores. The drawings for the general arrangement drawing for Contract 507 were titled "North Eastern Line 30 foot Distant semaphore", but the two detail drawings

The general arrangement drawings for Contract 450 "North Eastern Line Semaphore" dated March 1872. The left drawing shows the side elevation, while the drawing on the right shows the front elevation (note that it shows the lamp lens); yes, the arm is to the right of the post. The arm works in three positions; it is shown in detail at the 45 degree (caution) position, and in outline at the horizontal (clear) position. When at danger, the arm was inside the slot of the mast and invisible. The lamp and spectacle mounted on a carriage which ran on a rail fixed to the side of the post. The lamp is shown in its normal position at the top of the mast and, dotted, in the servicing position at the foot of the mast. The carriage was raised by means of a winch mounted inside the base of the post. The winch drum and handle is shown on the plan at the bottom of the page; the crank handle can also be seen on the front elevation. The signal is operated by a lever at the foot of the mast. This can be secured in any one of three positions. The downrod is inside the mast and a stud projects through a slot in the mast to operate the spectacle plate. The complete absence of any facilities to maintain the semaphore mechanism will be noted.



were simply titled "North Eastern Line Details of cast iron 30 feet semaphore". It is not known whether these signals were only provided for the NE line and only used as distants.

Both contracts were for cast iron semaphores, and the drawings for Contract 507 show them to be truly bizarre to modern eyes. Having said that, however, the fundamental design was almost identical to that of Contract 450. The key difference was the provision of a cast iron mast instead of a wrought iron mast. The semaphore arm still worked in three positions with the operating rod still (largely) inside the mast. The lamp was still mounted on a lamp carriage, together with the spectacle plate, which was raised and lowered by means of a winch mounted inside the post at ground level. The overall design, however, had been significantly improved.

The mast was a hollow cast iron tube in three pieces. The bottom 12" of the mast was turned round to fit in a socket in the sole plate. The next 4' was a pedestal 10" square in which was mounted the operating mechanism. Unlike the wrought iron semaphore masts of the previous year, ample openings in the pedestal were provided to maintain the mechanisms. Above the pedestal the mast itself started. This was, as already mentioned, in three pieces and tapered from 7" in diameter just above the pedestal to 5" just below the lamp. The two joints featured a 9" overlap to provide vertical rigidity, a set screw to prevent the two tubes twisting around each other, and a wrought iron band shrunk onto the outer tube at the lower end of the overlap to prevent the outer tube from splitting from the superincumbent weight. The top end of the cast iron mast was formed as a square cast iron box, 1' 11 1/2" long by 9" square which housed the upper operating mechanism and the pulley for the lamp carriage. Above this box was the housing for the arm. Formed by 2" by 2" angle iron, this housing was some 6' long and was bolted to the top of the cast iron post. The housing was open on all four sides and so the arm could be clearly seen even when it was at danger, vertical inside the housing. The cast iron was 1/2" thick at the lower pedestal, 7/16" thick at the base of the circular mast, 3/8" at the top of the circular mast, and 1/2" thick again at the upper cast iron box.

Although called a '30 foot' mast, just like contract 450, the basis for measurement had changed. This time the thirty foot was measured from ground level to the centreline of the lamp lens. The actual post was 36' 8 1/2" tall.

Cast iron steps were cast on the sides of the mast at 2' intervals to provide access to the mechanism at the top of the mast. The last step, however, was some 6 feet below the arm which must have called for some bravery in repairing the arm itself.

The mast was supported in exactly the same fashion as the previous design. The base of the mast was stepped into a cast iron sole plate which was tied to a large brick and concrete block.

This time the semaphore arm is to the left of the post. Details are not given of the arm, but it appears to be almost identical in size and construction to arm used on Contract 450.

The operating mechanism is an interesting illustration of how signalling design principles have changed. The connection between the operating lever at the base of the mast and the arm was via a 3/16" chain which pulled the arm to danger. Movement to caution and clear was by means of the weight of the arm; exactly the opposite of fail safe! The curious small cast iron ball poking out of the top of the arm near the pivot may have been provided to assist in moving the arm to clear.

The operating lever at the base of the mast had a bit both ways. The lever was provided with a handle at the outer

end and a quadrant in which a pin could be inserted to hold the lever in one of three positions. The general arrangement drawing, however, clearly shows that a chain could be connected to the lever for connection of a signal lead and, at the other end of the lever, a 28 lb cast iron balance weight was provided to return the semaphore to danger and pull the signal lead back through the pulleys.

The chain that pulled the arm to danger ran up the hollow centre of the mast. It was operated by a crank which was keyed to a spindle worked by operating lever. At the top of the mast there was not sufficient room for the chain in the arm housing. The chain was consequently connected to a pin which worked in a brass slide on the front of the upper box. A 1 1/2" by 1/4" operating bar ran from this pin to a crank on the semaphore arm outside (in front of) the arm housing. The pin did dual service as it also drove the spectacle plate.

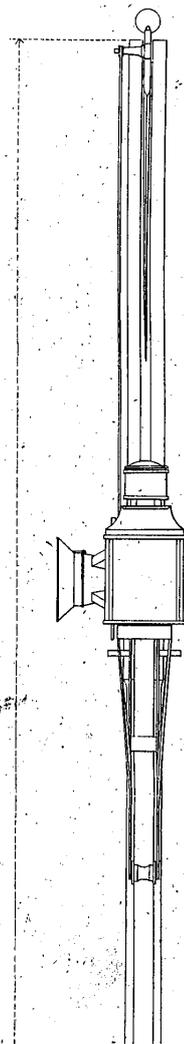
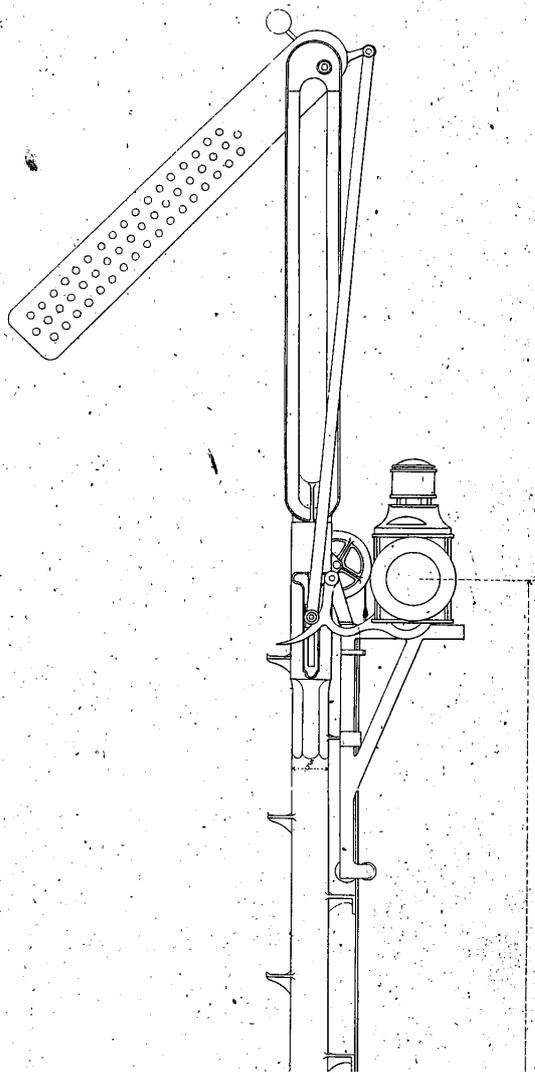
Like Contract 450, the lamp was mounted on a carriage which could be lowered for cleaning and filling. To raise and lower the lamp carriage, a winch was provided in the pedestal at the base of the mast and a 10 1/4" pulley at the top. The winch drum was 7 1/2" in diameter and was mounted inside the mast. A large opening was provided in the side of the pedestal to maintain the winch drum and cable. Three to one reduction gearing was provided between the crank handle and the drum with a pawl in the large gear wheel to hold the winch, and hence, lamp in position. The cable between the winch and the lamp carriage was specified to be copper sash cord.

The spectacle plate was mounted on the lamp carriage, as for Contract 450, and was consequently not directly connected to the operating mechanism. Instead, it was driven by the pin in the front of the post working the connection to the arm. The general arrangement drawing shows the arm at the caution position (showing a green light). To show danger, the pin was moved to its lowest position in the slide and this pushed the arm of the spectacle plate down and lifted the plate itself to show the light through red glass. To show clear, the pin was moved to the top of the slide and the spectacle plate dropped clear of the lamp to show a white light. This design shares the same weaknesses as Contract 450: the lamp carriage had to be raised all the way to the top of the mast before the spectacle plate would work, and as soon as the carriage was lowered from its working position the spectacle plate would drop to show a clear (white) light.

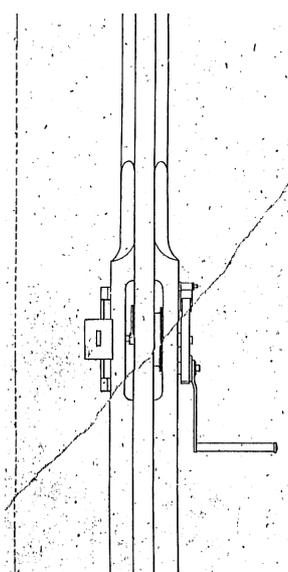
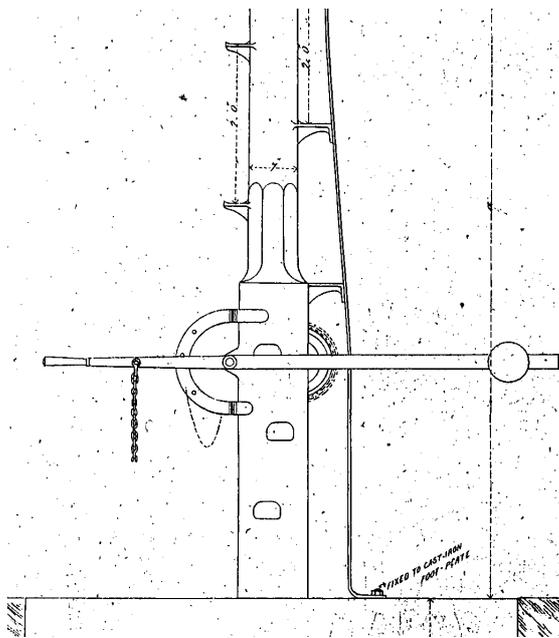
In summary, the design of the semaphore in Contract 507 was clearly derived from that in Contract 450, however the details were much improved. In particular, provision was made for maintenance. The use of cast iron for the semaphore mast instead of wrought iron is interesting. Cast iron was the ubiquitous construction material of the Victorian era engineer; much as concrete is for the modern civil engineer. Cast iron has much lower strength in tension than wrought iron and final completion of the mast cannot be undertaken on site. In consequence, the mast is more massive (i.e. heavier) and had to be divided into three pieces to make it possible to ship. However, the necessary joints would have to be accurately turned to result in a rigid mast. Although cast iron pillars were common (think of gas street lamps, cast iron water columns, and the cast iron pillars supporting water tanks), the cast iron semaphore was distinguished by its height and the fact that it was unstayed.

The major problem with this semaphore mast must have been its cost. A second issue would have been its immobility. Once together, I suspect that the mast would have been extremely difficult to take apart if it was ever required to relocate it.

There was a contract gazetted on 24 September 1875 for 'semaphores for [Wangaratta - Beechworth] railway. The



The front and side general arrangement drawings for Contract 502. Although the details are considerably different to that shown in Contract 450, the basic principles are identical: a three position arm with most of the operating mechanism housed within the mast and the lamp and spectacle mounted on a carriage which can be lowered to the base of the mast for servicing. The mast is of cast iron with a lower pedestal housing the lamp winch and lever operating the arm, a hollow column, and an upper box at the lamp level. The upper box houses the pulley for the lamp carriage drive, and the slide and pin that works the arm and spectacle plate. The operating rod connecting this pin and the arm can be clearly seen in the front view. The mast above the level of the lamp is formed from angle iron and, as can be seen, is open on all four sides. Cast iron footsteps provided to maintain the upper mechanism. The lever that operates the semaphore can be clearly seen at the foot of the mast in the front view. A handle and quadrant was provided to allow direct operation of the signal, but a chain and cast iron weight could be fitted to allow wire operation. The crank handle for operating the lamp winch can be seen in the side view.



contract was let to Langlands Foundry Coy for £216.17.6 and so would have probably been for cast iron masts; quite possibly for this type of mast.

Contracts 1031 and 1361

These two contracts are considered together as they related to almost identical designs.

Contract 1031 was for the 'making of 60 cast iron semaphores etc' and was won by Thomas Tozer in early 1878 with a bid of £1894.19.5. (The drawing was dated February 1878, Tozer signed the bid on 1 March 1878, and the contract was gazetted on 22 March 1878). On these figures, each semaphore cost some £38. Two years later, on 9 January 1880, a contract was let to Thompson & Co for the manufacture of 50 cast iron semaphores for £1244.7.0 (about 25 each). The final contract for cast iron semaphores, 1361, was also won by Thompson & Co in early 1881 and was for the manufacture of 20 semaphores. (The drawings for the contract were dated December 1880, the contract was signed on 11 February 1881, and the contract gazetted on 25 February.) This contract specified the lines for which the semaphores were destined: Dunolly - St Arnaud £41.11.3; Carlsruhe - Daylesford £41.11.3; South Yarra - Oakleigh £20.15.7; and Oakleigh - Sale £311.12.11. This almost certainly represents two posts each for the St Arnaud and Daylesford lines, one post for the Oakleigh line, and 15 for the Sale line and gives a cost of around £20 each.

Only one drawing for Contract 1031 survives. This detail drawing is headed 'Gippsland Line, Details of 20 feet Distant Semaphore' and shows the mast to have been almost identical to Contract 1361. Both the general arrangement and detail drawings have survived for Contract 1361 and are titled '20 feet Distant Semaphore'.

The new semaphores were again very similar to the preceding design in principle, but the details were quite different. The mast was still cast iron, however the operating mechanism was now located outside the mast. The semaphore only worked in two positions and was designed to be operated by wire, but could still be operated by hand if necessary. The lamp and spectacle were still mounted on a carriage which was raised to the top of the mast by chain, but the winch had been discarded. In short, the new design was very much a refinement of the previous design. The purpose of the refinements was to make the semaphore simpler and cheaper to construct.

One major simplification was in the semaphore mast itself. Gone was the complicated three piece cast iron mast. The mast was, more or less, a simple cast iron tube. It tapered from 6" diameter at ground level to 5" at the top of the mast (which was fitted with a neat domed cap). The cast iron walls were 3/8" thick throughout. Cast iron steps were provided on the mast for access to the operating mechanism at the top and further cast iron projections were provided at the base and the top on which to mount the mechanism. The mast was cast in two sections, each a little over 10 feet long. The joint was similar to that used in Contract 502, except that the upper section slotted into the lower and the outer (lower) section was prevented from splitting by an enlarged upper section.

The mast was stepped in a cast iron footstep which was embedded in a large (4' by 4' by 2'6") block of concrete. The weight of the mast was supported by the 1'6" square base of the footstep, and the turning moment was resisted by the large ribs that connected the base of the footstep to the socket in which the mast was stepped.

The semaphore arm was almost identical in construction to that used in Contract 450 and then in Contract 502. However, it only worked in two positions. Despite only working in two positions, the design 'clear' position was

still vertical. For the first time there was an acknowledgement on the drawing that arms did not necessarily go all the way, and the arm was considered 'on' from 0 to around 10 degrees and 'off' between 80 and 90 degrees.

The arm was mounted outside the post. To allow the arm to work to 90 degrees the arm was actually mounted behind the mast. In addition the spindle was mounted on the side of the mast and was off centre on the arm. This allowed most of the arm to be seen even when vertical.

The drive mechanism was quite modern and consisted of a vertical down rod worked by a T lever at the base of the post. A cast iron balance weight was provided on the long arm of the lever to return the signal to danger and pull the signal wire back through the pulleys. (The arm was not, of course, fail safe and would fall to clear if disconnected from the downrod.) Although arranged to be operated by wire, remnants of direct hand operation remained. A 5/8" pin was secured by chain to the lever and this pin could be inserted in holes drilled in the semaphore mast to hold the lever at the 'danger' or 'clear' positions.

The lamp and spectacle continued to be mounted on a lamp carriage which could be lowered to ground level. The winch provided on the previous two designs was dispensed with and an extremely simple counter weight mechanism was provided to raise the carriage to the top of the mast. The lamp carriage was connected by chain to a large 75 lb cast iron weight located in the hollow centre of the post (the chain ran around a pulley at the top of the mast). The weight was clearly heavy enough to counterbalance the lamp carriage, lamp (full of oil), and spectacle plate and, in falling, would pull the carriage to the top of the mast and hold it there. A second chain was ran from the bottom of the lamp carriage, down the outside of the post, through a hole in the base of the post, to the base of the counterweight. This chain would be used to pull the lamp carriage down to service the lamp and to steady its ascent to prevent the lamp from being jarred at the top of the post. A 3/8" pin was provided at the base of the post. This could be inserted in a hole in the lamp carriage rail to hold the carriage at the base of the post against the pull of the counter weight.

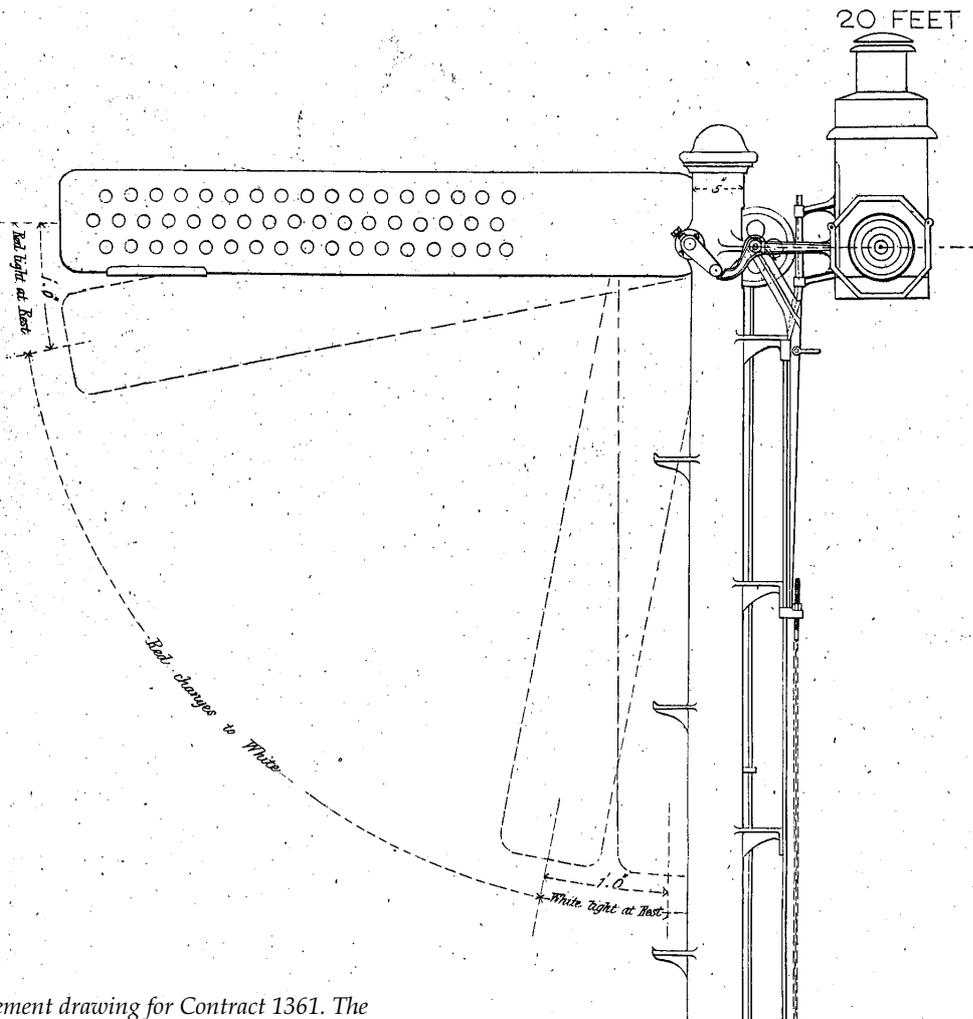
The spectacle plate was still mounted on the lamp carriage. When raised the spindle of the spectacle plate engaged in a housing on the mast; this positively located the lamp carriage (and hence the spectacle) at the top of the mast. The spectacle was driven by means of a crank on the arm spindle. The spectacle plate and crank arm appears to be the only difference between Contracts 1031 and 1361. In Contract 1031 it appears that the red glass was elongated vertically (7 1/4 across and 12 tall) to give a good 'on' light until the arm was well lowered. In Contract 1361 the glass was octagonal shaped 9" across the flats. In Contract 1031 the operating crank had two studs, while in Contract 1361 there was only one.

The simplification in design of these contracts compared with Contract 507 must have lowered the price significantly. The semaphore mast, in fact, appears surprisingly modern with all of its mechanism outside the mast.

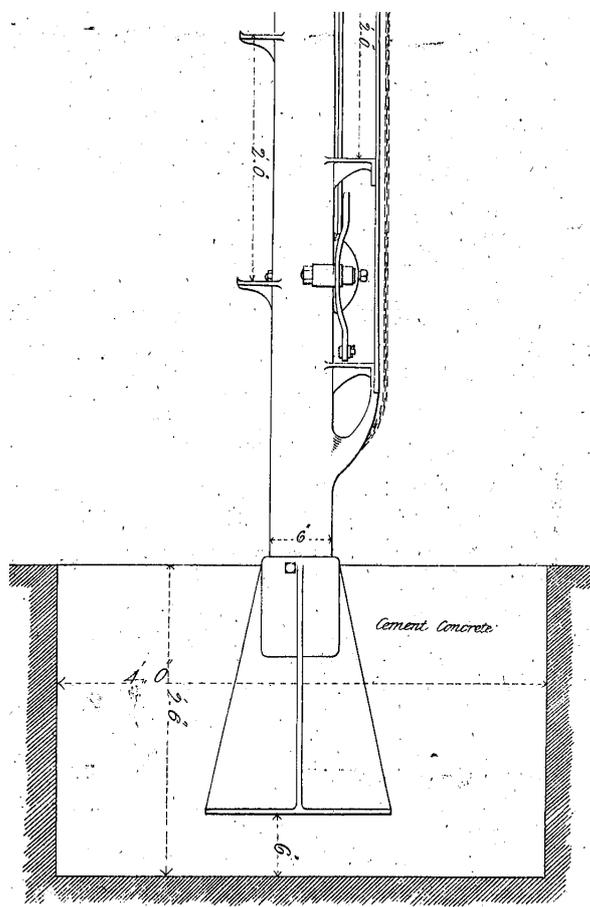
The main disadvantage of the signal would appear to be the use of cast iron for the mast and the complications caused by the continued use of the lamp carriage.

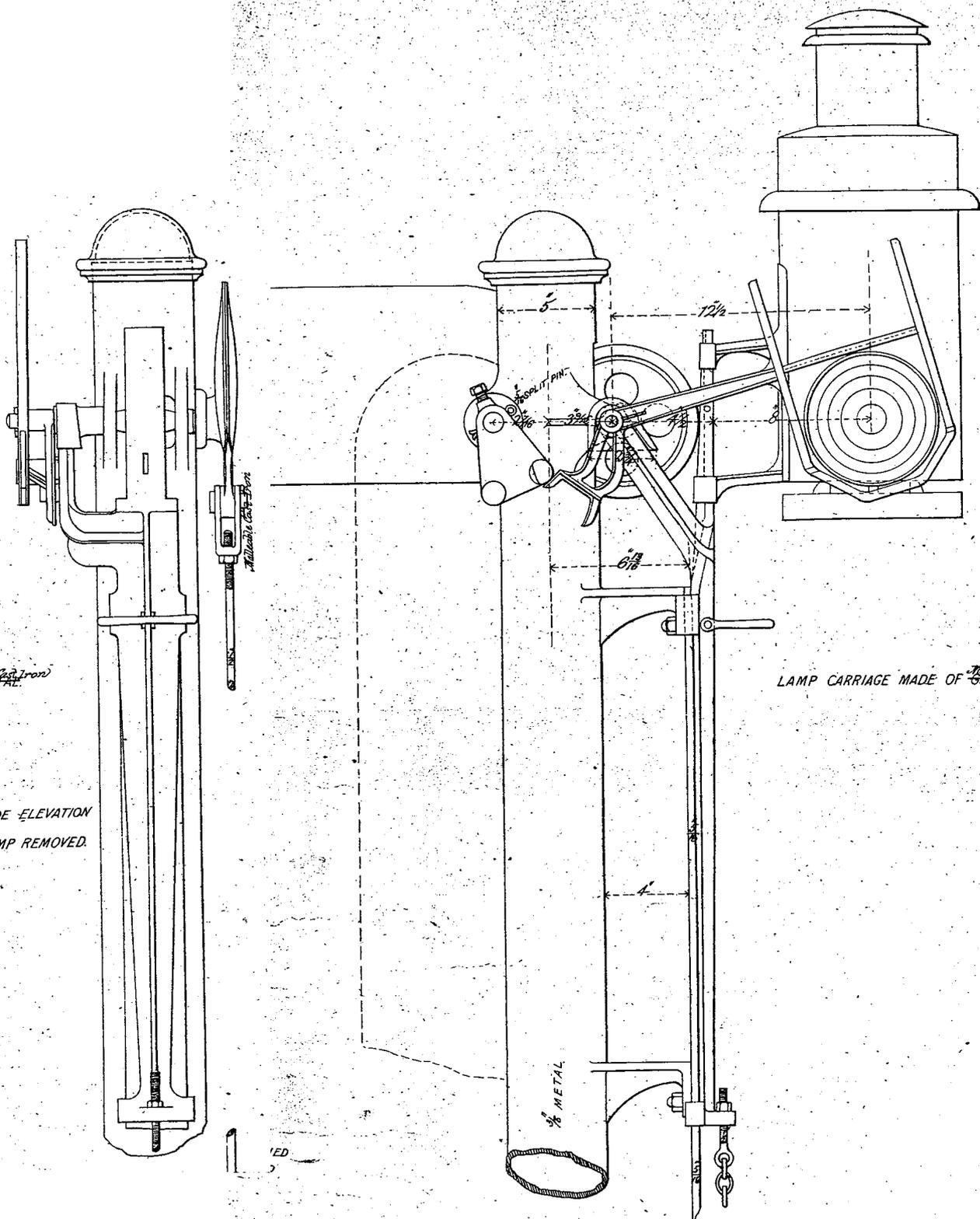
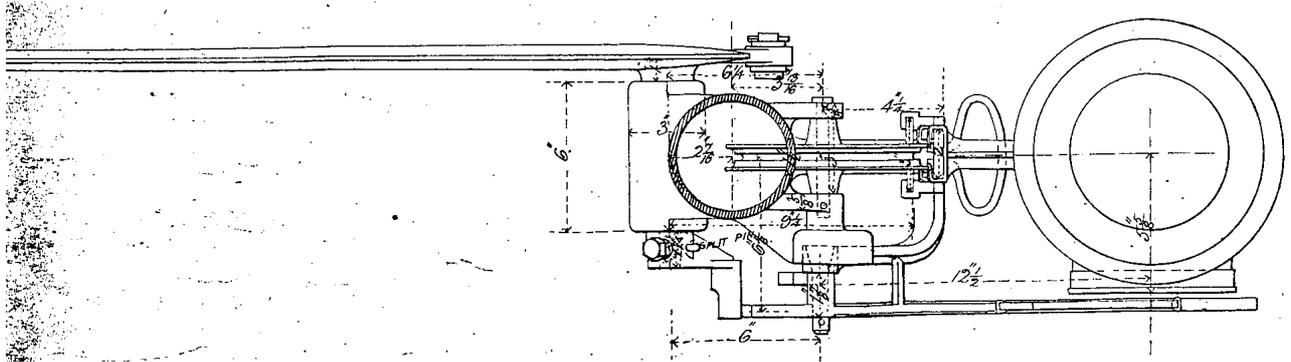
Mounting the lamp on a movable lamp carriage involved considerable complications and cost. Fixing the lamp at the top of the mast meant that the lamp carriage, the rail upon which it ran, and the pulley at the top of the mast became redundant. In addition, the spectacle plate could be directly coupled to the operating mechanism which was not only simpler, but resulted in positive operation. The additional cost, on the other hand, was a simple ladder and landing.

Replacing the cast iron mast with wood would also have



The general arrangement drawing for Contract 1361. The drawing for Contract 1031 would have been almost identical. The key difference between this mast and that of Contract 507 was of simplification. The operating mechanism was mounted outside the mast which removed the need for complicated castings and mechanisms at the top and base of the post. The lamp and spectacle plate were still mounted on a carriage which could be raised and lowered up and down the mast, but the winch had been dispensed with, replaced by a weight inside the post which held the carriage raised, and a chain to pull the carriage down. Even the base had been simplified; gone was the soleplate tied to the brick block, instead a simple socket embedded in mass concrete. The semaphore only worked in two positions: horizontal (Danger) and vertical (Clear). There was a design tolerance of about 10 degrees in both positions. Although the basic mechanisms are the same as in Contract 450, one is struck by how modern this mast appears with its external mechanism.





Cast Iron
ITAL

DE ELEVATION
AMP REMOVED.

LAMP CARRIAGE MADE OF METAL

1/8 METAL

ED

(Facing page) Detail drawings of the head of the mast of Contract 1031. The top drawing is a plan of the mast - note that the arm is mounted on the back of the mast. The lower drawings are side (left) and front elevations. The general arrangement drawing on page 69 is of Contract 1361 and the slight alterations to the spectacle plate and drive between the two contracts can be seen. Much of the equipment at the top of the mast is required to allow the lamp to be lowered for servicing; an obvious simplification is to fix the lamp and require the staff to climb the mast for servicing.

reduced the cost of the mast. With the extension of the railways to the forests in the east of the state, high quality hardwood masts were readily available. Wood masts were far less fragile than cast iron, this must have been a particular issue when it was necessary to transport, erect, modify or relocate a mast.

I would like to thank Colin Rutledge for making the drawings available.

KEW

(Continued from the May 2002 issue)

From 24 November 1930 the off-peak through service from Flinders Street was cancelled. Instead, off-peak services were maintained by a shuttle between Hawthorn and Kew. In October 1929 there had been 71 through trains each day Monday to Saturday, and 30 through trains on Sunday. In June 1936 (the next WTT I have) the service level to Kew was essentially unchanged - 69 trains Monday to Friday, 71 on Saturday, and 33 on Sunday - but few of these trains were through. On the weekdays there were just 18 through trains. In the morning, all trains ran through until after the 0853 departure from Kew. The shuttle then came on at Hawthorn at 0902 and maintained the service until it arrived at Hawthorn at 1647. There was then seven through trains until the shuttle came on again at 1850 and provided the service until the last train. The Saturday service was similar, except that there was a short period of through trains in the middle of the day (5 trains between 1210 and 1331) and a very short period of through trains in the evening (3 trains between 1733 and 1823). On Sunday all the trains were shuttles except for the two morning services; clearly it was not worth bringing on a train crew to work the shuttle for the morning.

The Stationmaster was temporarily withdrawn in late August 1933 and the station worked by an ASM supervised by Hawthorn. The Stationmaster was restored again on 9 October 1933.

Almost all of the through services, including all of the through afternoon peak services, were eliminated from 29 November 1937. On weekdays there were only two through trains, the 0800 and 0815 departures from Kew. The remaining 68 services were shuttles. There were slightly more through services on Saturdays. Of the 72 services, 7 departures from Kew were through: the 0800, 0815, 1222, 1237, 1255, 1311, and 1325. As can be seen, the two morning trains were the same as on weekdays, and there were five midday through services. The number of services on Sunday had actually been increased to 41, however none of them were through services.

From 5 June 1939 services on the Kew line became even more complex when the off peak services were replaced by a bus running in Denmark Street. The basic number of services was essentially unchanged, but the number of through services actually increased slightly. In the 2 October 1939 WTT the weekday timetable was arranged as follows. The early morning service was formed by an electric set which came on at Hawthorn at 0521. This then performed 6 return trips between Hawthorn and Kew before going off at Hawthorn at 0712. A through service then ran to Kew and returned to Flinders Street. The shuttle then came on again and ran to Kew and then formed a through service to Flinders Street. The next three services were through trains. The fourth through train, which arrived at Kew at 0840 then formed the shuttle which ran three services before going off at Hawthorn at 0913. Subsequent services were provided by a bus until the set at Hawthorn came on again at 1535 and provided the shuttle service until it arrived at Haw-

thorn at 1904 where it went off until the following morning. The evening service was provided by bus, except there was one late evening through train each Friday which arrived at Kew at 2135 and departed at 2141. The service was very similar on Saturday, except there were five through trains and one local shuttle in the early afternoon starting with the 1218 arrival at Kew and ending with the 1350 departure. There was no rail service on Saturday afternoons, or at all on Sunday.

At the start of the thirties there was a daily goods service, electricly hauled, which shunted Kew between 0120 and 0200. By January 1936 this had been reduced to run Monday, Wednesday, and Fridays only and ran slightly later shunting Kew 0225 to 0325. By October 1939 the goods had been retimed to run during the day, now shunting Kew between 1320 and 1400. It still ran on three days, but could conditionally run on Tuesday and Thursday.

From 16 April 1941 the Stationmaster (Class 6?) was replaced by a Class 1 Porter-in-charge supervised by Hawthorn.

By the WTT of 14 November 1943 the services had been reduced to 51 each weekday, 52 each Saturday, and 28 on Sunday. The service reductions was largely at the expense of bus trips; every second trip had been cancelled in the middle of the day and in the evening. The rail service in the morning peak had also been simplified. The shuttle came on at 0515 and provided the service until it departed Kew at 0811 when it ran through to Flinders Street. The next arrival at Kew was a through train and it returned through to Flinders Street at 0825. The subsequent arrival was also a through train, but then formed the shuttle and ran two return trips to Hawthorn before going off at Hawthorn at 0913. In the afternoon, the shuttle came on at 1535 and ran the service until going off again at 1904. On Saturdays the service was similar in the morning, but instead of an evening rail service the shuttle came on at 1218 and ran a few trips before going off again at 1343.

This level of service was basically maintained until 1950. However, the Saturday rail service was withdrawn in late 1946 or early 1947 (notified in WTT 2036/46). Dornan and Henderson state that this was due to the advent of the 40 hour week and consequent end of Saturday morning work.

Signalling alterations in this period were very minor. The disc on Post 3 was relocated to the right hand side of the post on 1 September 1939. An Annett lock was provided on lever 2 on 2 June 1947. The lock secured the lever reverse (i.e. with the Down Home at clear). The loose Annett key was to be kept locked in the station office unless the Signaller was at the frame.

By the issue of the WTT of 27 February 1950 all through services had been withdrawn. The shuttle now came on at Hawthorn at 0516, ran the morning peak, and went off again at 0915. It came on again for the afternoon peak at 1535 and went off again at 1904. Jim Foley records that around 1950 the shuttle was reduced to a one car ABM motor, probably with this timetable.

Rail passenger services were withdrawn from 18 August 1952. The last service was the 1902 Up which was driven by Driver Masterman. It appears that the bus services were drastically pruned at this time as well. In 1955 the bus service only ran on weekday peak periods. I do not have any record of when the bus service was withdrawn, but it had occurred by 30 November 1959.

Kew remained open (and staffed) for inwards and outwards goods and parcels traffic after withdrawal of the rail passenger service. Until at least 1950 the Goods service continued to run Monday, Wednesday, Friday and shunted Kew 1053 until 1200. By June 1955 it had been reduced to two days a week (Monday and Thursday). An ARHS special, hauled by D3 659, ran to Kew on 7 July 1956.

The ASM was finally withdrawn on 12 November 1956. From this date Kew was closed to parcels traffic and outwards goods traffic. The goods service continued to run, however, until Monday 13 May 1957 when it was withdrawn and the line closed.

The interlocking register states that the interlocking frame had been abolished a week earlier (on 6 May), but how the Down Home and points were worked after this is not recorded. The overhead wiring was taken out of commission on 9 July 1957, and the Staff lock removed from the low platform siding on 7 October 1957.

Jim Foley, writing in *Newsrail*, notes that the sidings at Kew were used by fuel and fodder merchants. In later years No 3 Road was mainly occupied by an SEC briquette dump.

It is ironic that the site of Kew station is now occupied by the headquarters of VicRoads. Doubly ironic, because the Kew line was not killed by cars, but by the electric tram.

Acknowledgements

Reference has been made to

- * An early history of the Hawthorn to Canterbury Railway, Glenn Cumming, Somersault Vol 10 No 3, p46-54
- * Victorian Railways to 62, Leo J. Harigan
- * The Electric Railways of Victoria, S.E. Dornan and R.G. Henderson, AETA, 1979.
- * Mickey's Mile, Jim Foley, *Newsrail*, February 1983
- * The Hawthorn - Kew Branch, Part 3 of the Lilydale - Healesville line and Branches, C.D. Gavan-Duffy, ARHS Bulletin, No 181, November 1952
- * Hawthorn, Change here for Kew, Wal Larsen, Australian Railway Enthusiast, June 1977
- * Time line history of Melbourne's Government Cable and Electric Trams and Buses, Barry George, Don Storey, John Birch, et al, ARE, 1997

SIGNALLING ALTERATIONS

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dures. *Down Train (Ararat to Maryborough)*. When a Down train is to run from Ararat to Maryborough by a Maryborough crew, the Signaller will issue the Train Staff to the Driver. The issuing of the Train to the Driver is to be noted in the TRB and this entry is to be signed by the Driver. The Driver is then responsible for securing the Train Staff until it is required. The Train Controller must be advised of the transfer. *Up Train*. When an Up train is to run from Maryborough to Ararat, the Signaller is to consult with the Train Controller as to further train movements. If no return train is to operate the Driver of the Up Train is to be instructed that the Train Staff is to be retained upon arrival at Ararat and returned to Maryborough. Upon arrival at Ararat the Driver must advise the Train Controller that the Train Staff is to be retained under cover. When the Train Crew return to Maryborough the Driver must deliver the Train Staff to the Signaller. A note as to the return of the Train Staff must be made in the TRB and this entry is to be signed by the Driver. If it is found that the Train Staff cannot be transferred by the Train Crew, the OiC must make suitable arrangements for the Train Staff to be returned.

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|------------|---|-----------------------|
| 26.05.2002 | Newmarket - Essendon
On Sunday, 26.5., Signals E201, E227, E244, and E261 were converted to Westinghouse RX8 210mm LED units. | (SW 51/02, WN 20/02) |
| 26.05.2002 | Dandenong
On Sunday, 26.5., Compound Points 642 will be converted to claw locks. | (SW 52/02, WN 17/02) |
| 31.05.2002 | Ashburton
From Friday, 31.5., circuit alterations were carried out to allow the panel to be switched in while a train is at Alamein without causing Up Home 10 to be restored to Stop. The indications on the panel for Closing lever 1 were altered to reflect the correct 'switched in' or 'switched out' status. | (SW 512/02, WN 21/02) |
| 02.06.2002 | South Kensington - Sunshine
On Sunday, 2.6., the following works were carried out: M244 (mast painted); M247 (mast replaced); M256 (mast straightened); M304 (mast welded); M321 (pole cap replaced); and M395 (mast replaced). | (SW 55/02, WN 21/02) |
| 02.06.2002 | Newmarket - Essendon
On Sunday, 26.5., Signals E296, E296P, E284, and E242 were converted to Westinghouse RX8 210mm LED units. | (SW 53/02, WN 20/02) |
| 02.06.2002 | Dandenong
On Sunday, 2.6., Compound Points 604D will be converted to claw locks. | (SW 54/02, WN 20/02) |
| 05.06.2002 | Ivanhoe
On Wednesday, 5.6., pedestrian gates were provided at Marshall St (12.332 km). | (SW 513/02, WN 21/02) |
| 05.06.2002 | Mitcham
On Wednesday, 5.6., pedestrian gates were provided at Rooks Rd (21.811 km). | (SW 514/02, WN 21/02) |