

SOMERSAULT

NOVEMBER 2001

Vol 24, No 6

SIGNALLING RECORD SOCIETY OF VICTORIA INC



"The switch stand in general service for main track is the revolving stand, consisting principally of four parts - an upright frame, a shaft, a lever and a target. The shaft usually stands in a vertical position, the bottom end being turned up for a crank, to which is attached a rod connecting with the switch rails. The shaft is usually held in an 'open' or 'closed' cast iron frame secured to the headblock. A lever, when can be thrown around horizontally, is attached to the shaft. The upper portion of the frame is usually flanged out to form a "table" or "top plate," the edge of which is notched to provide rests to hold the lever firmly in certain positions corresponding the different positions of the switch, provision being also being made to lock the lever fast in any of these positions. The lever is usually hinged to a collar which is keyed to the shaft, so that the outer portion of the lever can be turned down when being placed in the rest notch, thus leaving no parts projecting; this arrangement is commonly known as a "drop lever." [...] Near the upper end of the shaft [...] is placed a banner or target to denote the positions of the switch." This description of a typical US switchstand (from Camp 'Notes on Track') describes the standard SAR switchstand almost perfectly.

SOCIETY CONTACT INFORMATION

Published by the Signalling Record Society Victoria Inc (A0024029F)

EDITOR: Andrew Waugh, c/o CSIRO, 723 Swanston St, Carlton, 3053.

Phone (03) 9457 3795 (AH), (03) 8341 8215 (BH) Fax (03) 83418222

PRESIDENT: David Langley, P.O. Box 8, Avenel, 3664,

Phone (03) 5796 2337 (AH), (03) 5792 3288 (BH)

SECRETARY and MEMBERSHIP OFFICER: Glenn Cumming,

19 Peace St, Glen Iris, 3146. Phone (03) 9885 8546 (AH), (03) 9623 9704 (BH),

NSW PRESIDENT: Don Allitt,

8 Whites Ridge Road, Annangrove, NSW, 2156. Phone (02) 9679 1741

NSW GROUP SECRETARY: Bob Taaffe,

12 Western Crescent, Westleigh, 2120, Phone: (02) 9481 9994.

QUEENSLAND CONTACT: Phil Barker

PO Box 19, Strathpine, 4500, Qld

Unless articles use copyrighted information, articles may be reprinted without prior permission but acknowledgment is required. Opinions expressed in articles appearing in *SOMERSAULT* or supplements are not necessarily those of the S.R.S.V. (Inc.)

MINUTES OF MEETING HELD FRIDAY NOVEMBER 16, 2001,

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

Present: - N.Bamford, J.Black, W.Brook, G.Candy, G.Cleak, B.Crosby, G.Cumming, C.Gordon, A.Gostling, K.Lambert, D.Langley, B.McCurry, J.McLean, T.Murray, A.Ratcliffe, B.Sherry, P.Silva, A.Wheatland & R.Whitehead.

Apologies: - B.Cleak, A.Hinde, G.O'Flynn, T.Penn & A.Waugh.

Visitor: - J.Gordon.

The President, Mr. David Langley, took the chair & opened the meeting @ 20:14 hours.

Minutes of the September 2001 Meeting: - Accepted as published. R.Whitehead / B.Sherry. Carried.

Business Arising: - It was noted that the use of the term "A" light (as used in the minutes) could have a double meaning & the term "A" arm or "A" light unit should have been used instead when referring to the alterations to the Up Repeater at St.Albans.

Correspondence: - Payment for the hire of the meeting room was sent to the Surrey Hills Neighbourhood Centre.

A change of address was received from Brian Sherry.

A change of email address was received from Wilfrid Brook.

An email was received from Eddie Oliver with comments on future tours, a railway signalling museum & the proposed badge / logo.

An email was received from Andrew Hinde with comments on future tours, future syllabus items, a railway signalling museum & the proposed badge / logo.

A letter was received from Ross Cropley with comments on a railway signalling museum & the proposed badge / logo.

Letters were received from Graeme Reynolds with comments on a railway signalling museum & the proposed badge / logo.

A letter was received from Wayne McSween noting that he will not be renewing his membership this year & asking to be removed from the membership list.

A letter was sent to Bob Crosby advising Bob of the motion not to proceed with the production of the proposed badge & thanking him for efforts in this matter.

A letter & cheque was sent to Adrian Ponton as a result of his overpayment of his membership renewal.

A letter was received from Phillip Jeeves, Honorary Secretary of the Railway Heritage Centre of Victoria at Newport Workshops, along with the copies of the formal proposal dated December 1999 for the establishment of a Railway Heritage Centre at Newport Workshops.

Peter Silva took the opportunity to brief the meeting on the progress of the RHCV proposal as it currently stands. A.Ratcliffe / P.Silva. Carried.

Reports: - Tours. Glenn Cumming explained the proposal for the forthcoming tour to be held on Monday 24 September 2001. The reason for holding the tour on this day is to allow inspections of signal boxes between St.Albans & Kyneton that are only open on weekdays. Feedback of members in relation to this proposal is invited.

Archives. It was noted that the second room has been prepared for painting & it is hoped that this will commence shortly.

General Business: - David Langley noted the list of Unattended Train Order Terminal Stations & wondered how

different the list was from when Train Orders were first introduced.

Alex Ratcliffe noted that LED light units were now being used at road traffic light installations.

Alex Ratcliffe asked if the SRSV had a complete listing of all tours that the society had conducted & suggested that the society should compile an annual album of the societies activities.

Jack McLean noted that tour notes had been prepared for some tours in recent years & asked how many & for how long had this been done? The Secretary noted that tour notes had generally been prepared since Andrew Waugh had become Editor of Somersault.

Peter Silva noted that at the Annual General Meeting of the Rail Tourist Association, a summary of the past years tours was presented.

Bob Whitehead agreed that a summary of all tours organised by the SRSV should be compiled & to create an album for each tour.

Alex Ratcliffe suggested that the proposed album could include "before & after" shots of the locations visited, especially the forthcoming tour.

Moved Bob Whitehead, seconded Alex Ratcliffe, that the SRSV create a visual archive of activities, especially tours, past, present & future. Carried.

Jack McLean is looking for his 1918 Mt. Lyell Railway Rule Book. Could the person who has it please return it to Jack. It is needed for a research project.

Jack McLean described his research into the history of Spagnoletti Block Instruments on the Mt. Lyell Railway. Jack noted that the South Australian Railways used Spagnoletti Block Instruments up until 1894. Did the S.A.R. sell Spagnoletti Block Instruments to the Mt. Lyell Railway?

Jack McLean advised the Abt Railway in Tasmania would be worked under the rules for Train Staff & Ticket using a Victorian pattern Train Staff.

Keith Lambert reported that he has compiled a list of railmotor services from entries in the Weekly Notice.

Keith Lambert advised that LED signals would be installed between Heatherton - Ringwood soon.

David Langley noted that the new crossovers at Franklin Street were now in service.

Jack McLean commented about the opening hours for Diamond Creek & that Diamond Creek was now opened by car.

Andrew Wheatland advised that flashing lights & signalling alterations would be commissioned at Old Monbulk Road at Belgrave at Puffing Billy on Saturday 4 August 2001.

Andrew Wheatland reported that a proposal for a signal box & 40 lever interlocking machine at Belgrave at Puffing Billy had been approved in principle.

Bob Whitehead noted that while doing some research, he came across an incident where a wagon ran away from shunting at Thorpdale & came to rest one mile from Moe.

Glenn Cumming advised that signalling alterations at Spotswood would take place on Sunday 5 August 2001.

Chris Gordon reported on the installation of white rings on the target backgrounds of searchlight signals at Richmond Junction & at locations on the Dandenong Line. This is being done to improve signal sighting.

Chris Gordon described the arrangements on the Appleton Dock line including signals mounted on gantries. The work is yet to be commissioned.

Syllabus Item: - The President introduced member Keith Lambert to present the Syllabus Item.

Keith presented a collection of 30 slides from Victoria in the form of a "Where is it?" type quiz. The meeting was given ample opportunity to view the slides & deduce, estimate or just plain guess the location of each slide, each slide being met by "oohs" & "ahhs" or just plain "It doesn't look like that these days". The expected "Oh, isn't she gorgeous" comment failed to eventuate.

David Langley achieved a perfect score while Keith Lambert could only manage 29 out of 30 from his own slides because he tried to convince the meeting that a slide of Murtoa was actually Korong Vale!!

The presentation was thoroughly enjoyed by those present at the meeting, probably more for the great collection of slides rather than being able to identify all the locations.

At the completion of the Syllabus Item, The President thanked Keith for the entertainment & this was followed by acclamation from those present, along with the promise of a future invitation to do it all again at a future meeting.

Meeting closed @ 22:35 hours.

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

SIGNALLING ALTERATIONS

The following alterations were published in WN 32/01 to WN 39/01. 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.

- 18.08.2001 **Surrey Hills - Mont Albert** (SW 518/01, WN 33/01)
On Saturday, 18.8., alterations were carried out to the boom barrier holding sections applying to Up trains on the Centre line at Union Street and Mont Albert Road.
- 10.08.2001 **Clifton Hill** (SW 515/01, WN 32/01)
On Friday, 10.8., Dwarfs CHL113 and CHL118 were converted to LED lights.
- 12.08.2001 **Jolimont - West Richmond** (SW 517/01, WN 32/01)
On Sunday, 12.8., upper quadrant Automatics S57 and S70 between West Richmond and Jolimont were replaced by new posts with tri-colour LED heads. Circular SW 516/01 is cancelled.
- 13.08.2001 **Box Hill** (SW 513/01, WN 32/01)
Commencing Monday, 13.8., the block hours will be:
Monday - Friday 0600 to 1150 hours and 1400 to 1950 hours
Saturday, Sunday Switched out
- 13.08.2001 **Blackburn** (SW 513/01, WN 32/01)
Commencing Monday, 13.8., the block hours will be:
Monday - Friday 0650 to 1130 hours and 1530 to 1830 hours
Saturday, Sunday Switched out
- 13.08.2001 **Mitcham** (SW 513/01, WN 32/01)
Commencing Monday, 13.8., the block hours will be:
Monday - Saturday Switched out
Sunday 1030 to 1110 hours
- 26.08.2001 **West Richmond** (SW 519/01, WN 34/01)
On Sunday, 26.8., upper quadrant Automatics S65 and S75 were replaced by new posts with tri-colour LED heads.
- 27.08.2001 **Cheltenham** (SW 17/01, WN 33/01)
Commencing Monday, 27.8., the panel will only be switched in as required by Metrol.
- 02.09.2001 **South Kensington** (TS 103/01, WN 33/01)
On Sunday, 2.9., Points 668, 672D and 674 were converted from Clamp Locks to Claw Locks.
- 02.09.2001 **Werribee - Lara** (SW 1066/01, WN 34/01)
On Sunday, 2.9., Boom Barriers were provided at Browns Road (35.325 km). The boom barriers will work automatically for all trains on the Broad and Standard Gauge lines. The barriers will be controlled by track circuits on the Broad Gauge lines and by HXP level crossing predictors on the Standard Gauge line. Diagram 23/01 replaced 07/01.
- (03.09.2001) **Underground Loop** (TS 105/01, WN 34/01)
The Guards (Signal) Indicators at the Underground Loop Stations will be withdrawn from service.
- (03.09.2001) **Yarraville - Spotswood** (TS 106/01, WN 34/01)
Down Automatic W333 has had been painted with a white band around the black target as a trial to assist in signal sighting.
- 03.09.2001 **Spotswood** (SW 018/01, WN 33/01)
From Monday, 3.9., Diagram 17/01 replaced 21/96. Points 9, 12, and 13 were removed. Down Home 6 and Up Home 20 were converted to Automatic signals and renumbered W341 and W348 respectively. Spotswood Signalbox was decommissioned on Sunday 12.08.01 (according to SW 15/01).
- 07.09.2001 **Glen Iris - Darling** (SW 521/01, WN 35/01)
From Friday, 7.9., Automatic DG343 was converted to reverse stagger. The light units were lowered 1 metre.
- 09.09.2001 **Collingwood** (SW 522/01, WN 35/01)
On Sunday, 9.9., upper quadrant Automatics S106 and S107 were replaced by new masts with tri-colour LED heads. The lower light on Post S107 is fixed at red until the final commissioning of the new signalling.
- (10.09.2001) **Morwell Briquette Siding** (SW 1079/01, WN 35/01)
The Hazlewood Siding was abolished. The 4 sidings on the eastern side of the Loading Chutes have been abolished. Sidings 1 to 6, 7, and 8 through the loading chute have been terminated 100 metres on the Down side of the chute. Baulks have been provided on the sidings. All track and point work on the Down side of the baulks have been removed.
- 16.09.2001 **North Richmond** (SW 523/01, WN 37/01)
On Sunday, 16.9., upper quadrant Automatic S93 was replaced by a new mast with tri-colour LED heads.
- (17.09.2001) **Morwell Briquette Siding** (SW 1081/01, WN 36/01)
The Morwell Briquette Siding is again available for traffic following rationalisation of track. Sidings 4 and 5 at the Briquette Loading Area are considered to loading tracks.

- 20.09.2001 **Spencer Street** (TS 59/01, WN 37/01)
 On Thursday, 20.9., Parcels Siding Nos 1 and 2 and the Van Dock were booked out of service due to the Collins Street Extension Project.
 Points 013D and 014 were secured normal by locking devices. Home 110 is prevented from clearing for a route towards the Van Dock or Parcels Sidings. Baulks are provided in the lead to the Parcels Sidings between points 023D and 017D.
- 23.09.2001 **Victoria Park** (SW 524/01, WN 38/01)
 On Sunday, 23.9., Down Home VPK102 was replaced by a new mast located 10 metres in the Up direction and fitted with tri-colour LED heads. The new post is not fitted with an illuminated Letter 'A'.
 The main line crossover (Crossover 002) and Up Dwarf VPK109 were booked out of service until final commissioning of the new signalling.
- (24.09.2001) **Flinders Street** (TS 115/01, WN 37/01)
 A light diffuser has been provided the C light on Home 575.
- (24.09.2001) **Maribyrnong River Goods Line** (SW 24/01, WN 37/01)
 The current Operation Procedure 13 (Maribryngong River Line and Junction) and SW 1243/99 (National Logistics Shunting Operations in C Siding) is to be replaced by the following.
 1. Maribryngong River Goods Line
 The Maribryngong River Goods Line runs between the lead from the Down Through Suburban Line at South Kensington (Maribryngong River Junction) and the Youell Street level crossing, Footscray.
 The Signaller, Metrol, controls the entrance to the line for Down movements and the Signaller, West Tower, controls the entrance to the line for Up movements. Only one train is permitted to operate on the Maribryngong River Goods line at the same time. The Signallers, Metrol and West Tower, are responsible for communicating to ensure that this is complied with.
 All communications between the train crews and the Signaller, West Tower, will be by radio on Channel 9.
 The following details must be entered across the figure line of the West Tower TRB: the time permission is granted for a train to operate over the line; the Driver's name; the locomotive number; and the time the train is reported arriving clear at Youell Street or Maribryngong River Junction.
 Down Trains
 Prior to a train or light locomotive departing from South Kensington for the Maribryngong River Goods line the Signaller, Metrol, must confirm with the Signaller, West Tower, that the Driver has been granted permission to travel over the Maribryngong River Goods line. When the train has arrived at the Maribryngong River Goods sidings and all shunting movements over Youell Street have been completed the Driver must advise the Signaller, West Tower.
 If a second train is required to enter the Maribryngong River Goods line while the first is still at the Maribryngong River Goods sidings, the procedure to be followed by the Signaller, Metrol will be the same as that followed for the first train. The Signaller, West Tower, must also advise the Driver of the second train that another train is operating in the sidings. Prior to passing over Youell Street the Driver of the second train must contact the Driver of the first train and come to a clear understanding of the movements to take place.
 Up Trains
 Prior to departing from the sidings the Driver must obtain permission from the Signaller, West Tower. Prior to granting this permission, the Signaller, West Tower, must obtain permission from the Signaller, Metrol. When the train is clear of the Maribryngong River Goods line the Driver and the Signaller, Metrol, must advise the Signaller, West Tower.
 Youell Street
 A competent employee must protect the level crossing before a train proceeds across it.
 Operation of Road/Rail Vehicles or Track Machines or Vehicles
 Road/Rail Vehicles, Track Machines, and Track Vehicles must be signalled in the same manner as a train.
- 01.10.2001 **Traralgon - Sale** (SW 1072/01, WN 39)
 From Monday, 1.10., Staff Exchange Boxes were provided in locked cabinets on the platforms at both Traralgon and Sale. Use of the Staff Exchange Boxes is authorised for Train 9442.
 The following are to be added as new Operating Procedures:
 130A Morwell
 Permission is granted for the Signaller, Morwell, to use the Electric Staff used for Train 9462 for Train 9442 without passing it through the instrument. The Staff is to be kept in the pocket of the instrument. When Train 9442 does not run the Staff must be kept in the pocket of the instrument until the Signaller, Traralgon, commences duty. Provided there are no other trains operating between Morwell and Moe, the Signaller, Morwell, may cease duty when Train 9442 is at least 400 metres beyond Morewell and proceeding on its journey.
 130B Traralgon - Staff Exchange Box
 A Staff Exchange Box is provided on the station platform. The box is located in a locked cabinet near the door to the station office.

The box has two openings in the base to secure the staffs. When in use the forward section Staff will be secured in one of the openings. The Driver will insert the rear section Staff in the free opening (lettered end out) and give the Staff half a turn. This will free the forward section Staff which can be removed by giving it a half turn. Upon commencing duty the Signaller will obtain the releasing key. This is inserted in the free opening and given half a turn to release the rear section Staff.

Prior to ceasing duty at Traralgon, the Signaller must have a clear understanding of the arrangements with the Signallers at the adjoining Staff stations. In the case of an Up train, the Signaller must select an Electric Staff that is straight, with tight rings, and a feather in the key which is clear and not burred. The Staff must be inserted in the Staff Exchange Box and the box tested by removing the Staff using the releasing key. If successful, the Staff must be re-inserted and releasing key removed. The appropriate fixed signals must then be cleared. The Train Controller must then be notified of the time when a Signaller will next be on duty and the TRB suitably endorsed.

Prior to the departure of the train from either Morwell or Sale, the Signaller must instruct the Driver that the Staff Exchange Box is in use at Traralgon and record the time of departure in the TRB.

On arrival at Traralgon the Driver must insert the rear section Staff in the Staff Exchange Box and obtain the forward section Staff. The Driver must advise the Train Controller of the arrival and departure times at Traralgon, and, if required, advise the Train Controller when the train has departed complete.

Upon arrival of the train at Morwell or Sale, the Signaller must check that the train has arrived complete with Tail Signal on the rear vehicle. In the case of an Electric Staff, the Staff is to be retained in the pocket of the instrument until the Signaller at Traralgon commences duty. When the Signaller at Traralgon commences duty the Train Arrival signal or ACRE message is to be sent in the usual manner. The Train Controller is to be advised of the train's arrival.

Upon commencing duty at Traralgon, the Signaller must confer with the Signaller in advance and the Train Controller to confirm that the last train departed complete. They must then send the Train Arrival signal or ACRE message to the Signaller in the rear and endorse the TRB.

Failure of Home Signals at Traralgon

Should a train operating on the Staff Exchange Box arrive at Traralgon and find the Home signal at Stop the Driver is to challenge the signal by sounding one long whistle. If no response is obtained the Driver must inform the Train Controller. If Traralgon is unattended the Train Controller will instruct the Driver to inspect the points and ensure that they are set and locked for the movement. If this is so and the arrival track is clear the Driver may pass the Home signal at the Stop position. The Train Controller must arrange for a Signaller to attend and notify the Signal Maintenance Technician.

130C Sale - Staff Exchange Box

(The instructions are the same as for Traralgon)

07.10.2001 **Flinders Street** (TS 123/01, WN 39/01)

On Sunday, 7.10., Up Homes 769 (Up Special Line) and 955 (Up Sandringham Line) were fitted with multilens LED heads. In addition, an arrow type route indicator was provided on Post 957 to indicate movements towards Home 955.

07.10.2001 **Altona Junction** (TS 124/01, WN 39/01)

On Sunday, 7.10., Homes 206 and 208 were fitted with multilens LED heads.

VICTORIAN SIGNALLING SYMBOLS

PART III - CROSSING SYMBOLS

(Continued from page 108)

along the intersecting roads). Older diagrams, say from the '50s, tend to show 2 light masts exclusively, while modern diagrams tend to show 4 light masts but whether this reflects the actual equipment on the mast is not known.

Figure 2f is a mast equipped with a boom barrier, 4 light flashing light unit, and bell; this is the most typical arrangement of a boom barrier mast.

Figure 2g is a set of flashing lights on a cantilever mast.

Pedestrian Gates

Figure 3 show the symbols used for pedestrian gates. Figures 3a, 3b, and 3c show mechanically operated wickets. Figure 3a is found on very old interlocking sketches (say

before 1900). Figure 3b is the normal symbol for the 'slamming' or 'normally closed' type wicket. These wickets are normally shut and have to be opened against a weight; the lever operating the wicket simply locks the wicket shut. Figure 3c is the symbol for a 'normally open' type wicket. These are direct worked by the lever. Figure 3d is used for pedestrian boom barriers and Figure 3e for the motorised (automatic) wicket gates.

SWITCHSTANDS

Chris Wurr

As pointed out in the September issue of Somersault, there have been three (probably technically speaking, four) designs of switchstands used in Victoria. In the following article I will attempt to detail their evolution as far as my limited research material will allow.

General history

The switchstand can probably be best described as a North American re-configuration of the early English railways disc and crossbar signal. Whereas in early English practice, these were used as running signals, the Americans adapted the device to give positive indications of the lie of hand operated points (or switches in U.S. parlance). From photos of North American railway scenes of the last 20 years or so, it would appear that the practice of giving a positive indication of both lies of points has been largely dispensed with. Most photos show switchstands which have no indication when the points are lying for the straight road, only a red indication when the points are set for a diverge.

A brief history of the switchstand in Australia

South Australian Railways

It would appear that the switchstand made its first appearance in Australia on (predictably enough!) the South Australian Railways under the regime of Commissioner W.A. Webb. William Alfred Webb was an experienced railroad man recruited by the South Australian state government to reform the run-down and seriously financially desperate South Australian Railways. His last employer in the U.S. before appointment in South Australia was the 3000 mile long Missouri, Kansas, Texas Railroad (affectionately known as "the Katy"). During Webb's reign from 1922 to 1930 at the helm of the ailing S.A.R., he introduced many American ideas. Among them, which we are concerned with here, was the switchstand.

Limited reference material I have at my disposal would indicate that the simple, but effective, switchstand was first installed in Australia on the Mt. Barker Junction to Victor Harbor line (along with Train Control and Train Orders) commencing on 22nd November 1926. From there they proliferated throughout the entire S.A.R. system and even across the borders to neighbouring systems.

Silverton Tramway Co

Almost exactly a year to the day later, the Silverton Tramway Company who ran the privately owned and operated connection between the S.A.R's line at Cockburn (on the S.A./N.S.W. border) to Broken Hil, must have thought switchstands would be the "go" and introduced them to their 36 mile, 3'6" gauge system in far western New South Wales. This appears to have commenced on 16th November 1927.

It would not be unexpected that the Victorian Railways Chariman of Commissioners, Harold W. Clapp, would not be averse to casting an eye to the S.A.R. system for anything which might have been of use to Victoria. Clapp reigned from 1920 until 1939 and, although Australian born, he had had some previous American railroad experience before coming to the V.R.

Victorian Railways

Double wire control of points and signals commenced in Victoria with the first installation at Glen Iris on 19th November 1926. Switchstands were NOT part of this initial

installation. The second application of double wire control occurred in a simplified form at Pakenham on 3rd October 1929 and this appears to have included the first switchstands in Victoria. Whereas South Australia and the Silverton employed switchstands as padlocked hand operated mechanisms to throw points, Victoria used their first switchstands exclusively to indicate the direction in which double wire operated points were lying. By no means did all double wire operated set-ups include switchstands, though.

The then single line between Dandenong and Warragul was intensively equipped with double wire control in the period 1929-1932. Then, in 1934 attention was turned to the Ballarat to Geelong mainline where the original double line was being singled in dribs and drabs. The author is unsure how many locations on the eastern actually received switchstands, but certainly every double wire location between Warrenheip and Gheringhap was equipped with them. The only other Victorian installations which received switchstands, of which I am aware, were Moe and Redcliffs. I would be delighted to be contradicted on this!

The eastern line set-ups disappeared as the line was progressively doubled in the lead up to electrification in the 1950s. The Ballarat - Geelong ones lasted until the replacement of Electric Staff by Section Authority working and consequent de-manning of locations along that line. Indeed, the very last, single, solitary double wire switchstand left in the state still resides at the Up end of Meredith.

Commonwealth Railways

The Commonwealth appears to have embraced the switchstand initially on the east-west line from Port Pirie to Kalgoorlie at the time of the demise of miniature Electric Staff working on this line. In the early part of the 1960s, Train Order working replaced Electric Staff working in various stages across the Nullabor and it would appear that hand points previously operated by what the N.S.W. call "kangaroo levers" were then converted to operate by means of small point levers rodded to switchstands.

Meanwhile, back on the V.R.

Thirty seven years were to pass before the switchstand made a re-appearance in another guise. On 15 December 1966, the first installation of mainline trailable points were commissioned at Pura Pura on the Gheringhap - Maroona "Pleurisy Plains" line. Switchstands in a reconfigured format were used to indicate to approaching trains the status of the points. This was the forerunner of an eventual total of eight such set-ups at crossing loops on this line. The trailable points on this line were actuated by a hydraulic ram and locked by a counterweighted locking rod. The switchstand was attached to the locking rod, thus indicating that the points were set AND LOCKED for the correct facing move.

The next use of switchstands, again in connection with trailable points at crossing loops, occurred on the Ararat to Portland line in 1986. This set-up was slightly different to the plains line using a US&S trailable point operating mechanism.

A further variation in the layout of trailable points (and therefore the switchstands) commenced on the Ballarat to Mildura line in 1987. Eventually 13 crossing loops on this line were equipped with this final (thus far) configuration.

Descriptions

South Australian Railways

Switchstands used on the former S.A.R. are almost exclusively a quarter turn, hand-operated mechanism with a hinged handle which seats into the stand casting to hold the point blade either normal or reverse. The handle can be padlocked in either position to secure against unauthorised movement. With the exception of Raycor Spring Switches, of which I have only ever seen one example on the S.A.R., switchstand operated points cannot be trailed through against the point blade.

S.A.R. switchstands formerly sported Adlake kerosene lamps at the top. These were similar to Adlake's No 206 switch lamp, but with 5" lenses in all four directions. The banners were reflectorised and the switch lamps removed in the early 1980s as an economy measure and probably also as a result of a shortage of spare parts for the lamps.

Mainline switchstand indication comprise:-

- * Points set for the mainline - a green fishtailed arrow inclined at an angle of 30 degrees with a green light at night.
- * Points set for the passing siding - two horizontal yellow discs (called "dumbbells" by S.A.R. enginemen) with a yellow light at night.
- * Points set for freight line or dead-end - two horizontal red discs with a red light by night.

Subsidiary switchstand indications:-

- * Points set for passing siding and for straight lead in freight lines - one single yellow disc with a yellow light at night.
- * Points set for freight line from passing sidings and

for diverging lead in freight lines or derail off - a white square banner with a white light by night

- * Derail on - a purple diamond banner with a purple light at night.

The author has seen a South Australian switchstand described as a "Romano" switchstand in a caption for a photo of the Penrice stone train in the American railroad magazine "Trains". I am unsure if this refers to the type or original manufacturer, and I have never seen this reference anywhere else. Can anyone enlighten me on this?

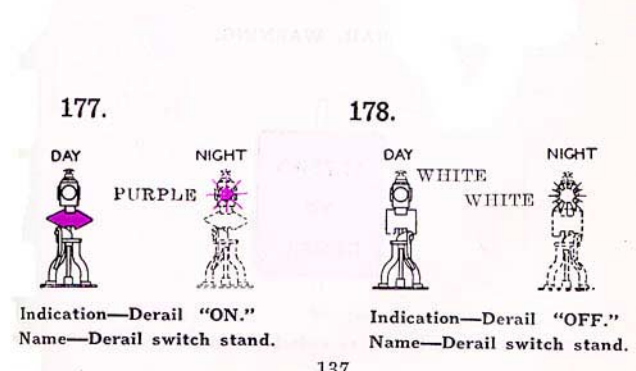
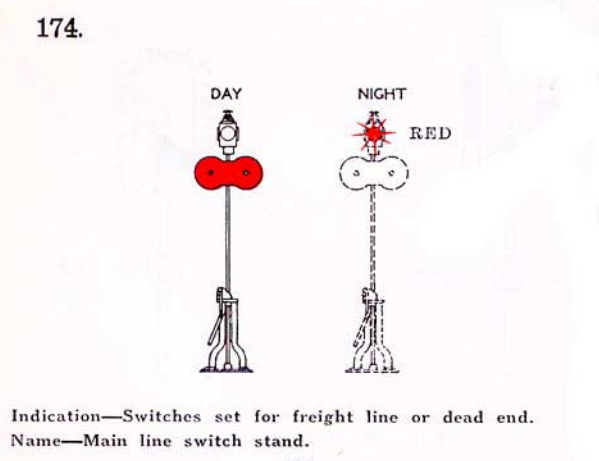
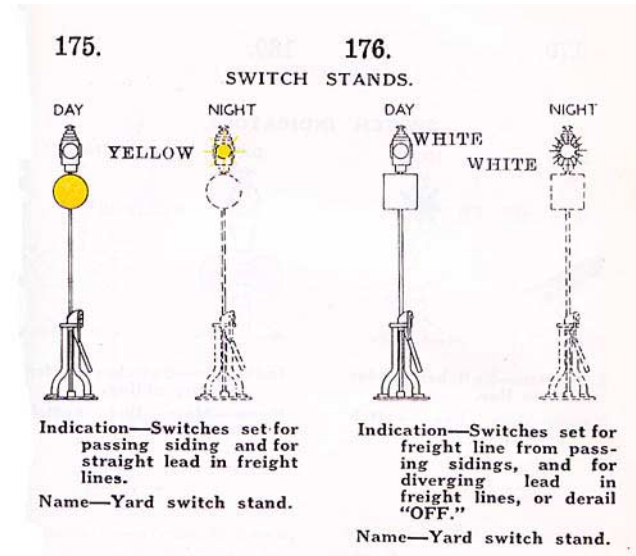
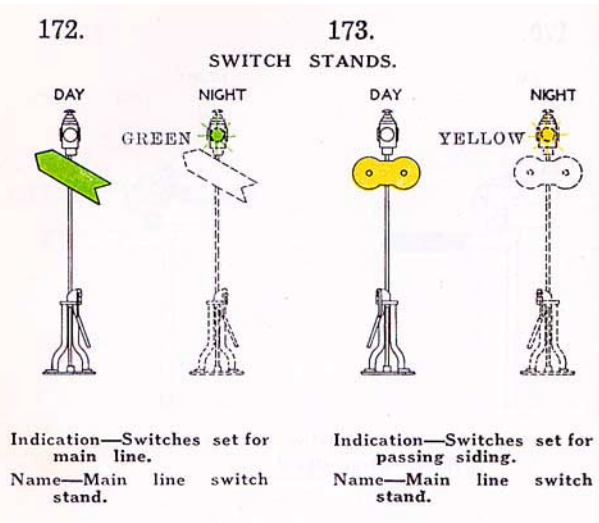
Silverton Tramway Company

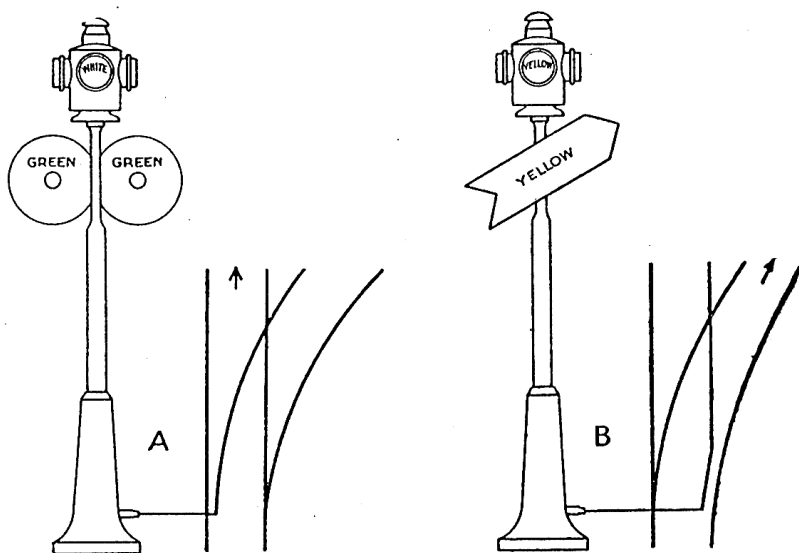
The company's circular No 260, dated 26th November 1927, gives details of the indications of the switchstands. The diagrams show a single lens lamp for the night indications. It seems highly improbable that these are not Adlake lamps identical to those used on the S.A.R.

The original indications displayed on switchstands were:-

- * Points set for mainline - a vertical green fishtailed arrow pointing downwards with a green light by night. At some later stage, no doubt to increase visibility, the green arrow was repainted white with two downward pointing black chevrons. Presumably this change occurred at the same time the switch lamp was dispensed with.
- * Points set for passing siding - two vertical yellow discs with a yellow light at night.
- * Points set for goods siding or dead end - two vertical red discs and a red light at night.

(Below) The aspects and indications of the SAR switchstands as shown in the 1947 Rulebook.





(Above) The diagram of the Victorian Double Wire switchstands published in WN 42/29 (Below) The switchstand on the Down end points at Lethbridge in May 1988. The photo is taken from the front quarter and both the two white discs and the yellow arrow can be seen. When this photo was taken the switchstands at Meredith, Lethbridge, and Lal Lal were still equipped with lamps however the conduit snaking up the staff indicates that an electric lamp has been provided.



The arrows and discs being arranged vertically on the stand must have made for difficult sighting by train crew, but as the Silverton was not a high-speed operation, it was probably not a problem.

Victorian Railways

Double Wire control

Weekly Notice 42/29 (issued 15th October 1929) describes Victoria's first switchstands as used in conjunction with Double Wire operation of points. As previously related, the switchstands worked in conjunction with Double Wire operated points thus making them a point indicator, although WN 42/29 actually uses the term "switchstand". These switchstands were virtually the reverse of the "crow-eater" version, thus:-

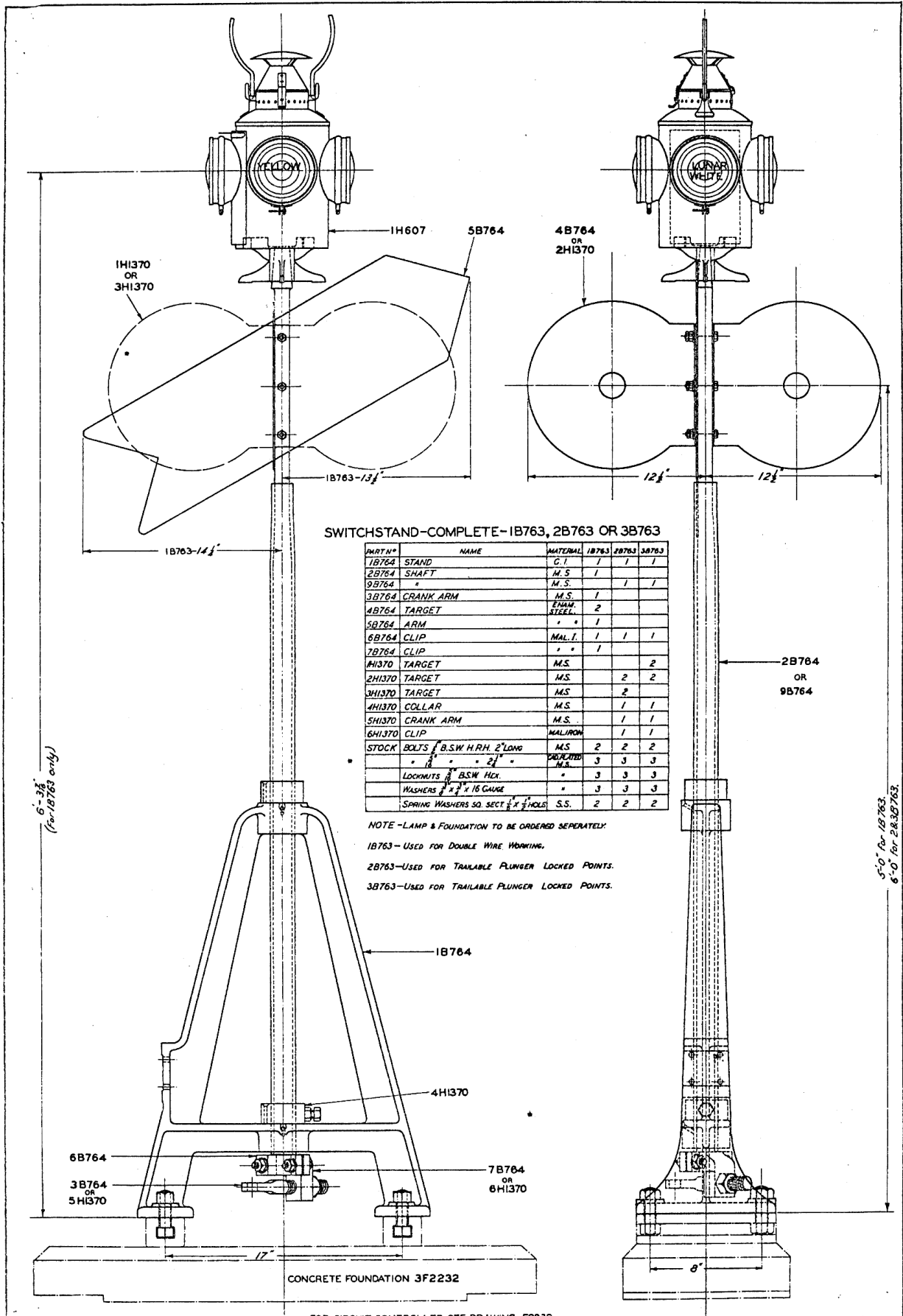
- * Points set for No 1 (straight) road - two horizontal greendiscs with a lunar white light at night. (A lunar white light is one with no yellow tinge to it from the kerosene flame. This was achieved by the use of special lenses which appear to have a blue colour to them. However, when an incandescent light is seen through the lens the resultant beam of light is pure lunar white.)
- * Points set for No 2 (diverging) road - a yellow fishtailed arrow inclined at 30 degrees and pointing in the direction of the diverge and a yellow light by night.

The switchstands were described as being normally about 6 feet in height. As with all standard signalling equipment on the V.R., there was invariably at least one exception. Moe Up end proved to be the exception with a dwarf version of the usual switchstand, standing no more than 18" tall, being connected to the mainline points from 3rd February 1931.

Now, you might think that "Do-It-Yourself" is a phenomenon of the 1990s, but the V.R. had well and truly perfected the art by 1929! So, presumably to avoid having to purchase switch lamps from Adams and Westlake (Adlake) in the U.S.A. or pay a patent fee, the V.R. manufactured their own lamps to slightly smaller overall dimensions with 4 1/2" lenses.

The initial installation at Pakenham was commissioned on 3 October 1929 but it took the V.R. Printing Works another 12 days to get the instructions and description into the Weekly Notice. It then took some bright spark maybe another four weeks to realize that a lunar white night indication in conjunction with a green discs day indication was not quite consistent! Thus Weekly Notice 47/29, five weeks later, announced that the green discs indication by day was henceforward altered to white discs. No one can tell me why the V.R. elected to reverse the arrows and "dumbbells" display compared with South Australia.

The last remaining example of this type of switchstand can be seen at the Up end of Meredith. Approximately 10 years ago, or maybe more, some person performed an unau-



SWITCHSTAND-COMplete-1B763, 2B763 OR 3B763

PART NO	NAME	MATERIAL	1B763	2B763	3B763
1B764	STAND	C.I.	1	1	1
2B764	SHAFT	M.S.	1	1	1
9B764	"	M.S.	1	1	1
3B764	CRANK ARM	M.S.	1		
4B764	TARGET	ENAM. IRON	2		
5B764	ARM	" "	1		
6B764	CLIP	MAL.I.	1	1	1
7B764	CLIP	" "	1		
1H1370	TARGET	M.S.		2	
2H1370	TARGET	M.S.		2	2
3H1370	TARGET	M.S.		2	
4H1370	COLLAR	M.S.	1	1	
5H1370	CRANK ARM	M.S.	1	1	
6H1370	CLIP	MALIRON	1	1	
STOCK	BOLTS 1/2" B.S.W. H.R.H. 2" LONG	M.S.	2	2	2
	" 1/2" " " 2" "	POBLATED M.S.	3	3	3
	LOCKWITS 1/2" BSW HEX	"	3	3	3
	WASHERS 1/2" x 1/8 GAUGE	"	3	3	3
	SPRING WASHERS SQ. SECT 1/2" x 1/2" HOLS	S.S.	2	2	2

NOTE - LAMP & FOUNDATION TO BE ORDERED SEPERATELY:

1B763 - USED FOR DOUBLE WIRE WORKING.

2B763 - USED FOR TRAILABLE PLUNGER LOCKED POINTS.

3B763 - USED FOR TRAILABLE PLUNGER LOCKED POINTS.

24-7-30

B763

7/19/38

7-012

ALTERATION No 1347	ALTERATION No 1311	ALTERATION No 1242
-----------------------	-----------------------	-----------------------

VICTORIAN RAILWAYS

**SWITCH STAND
(HIGH TYPE)
ASSEMBLY**

CHIEF ENGR. DRAWN BY
SIGS. & TELS. S.C.O. TRACED BY
P.A.D.

B763

24-7-30

SCALE - 3/16" = 1 FT.

(Left) B763, the assembly drawing for a Victorian Switchstand. Variation 1B763 was used for Double Wire points, and 2B763/3B763 on the trailable points between Gheringhap and Maroona. This drawing was dated 24 July 1930 and was amended in 1966/7/8 to show the trailable point variations. Although the drawing shows a lamp, this does not indicate that trailable point variations were so fitted. As the drawing says "Lamp and foundation to be ordered separately"

thorised modification on the yellow arrow indication by inverting it so that it now points downwards at an angle of 30 degrees.

Trailable points: Gheringhap - Maroona

The indications on these trailable point switchstands were always conveyed by means of two horizontal reflectorized discs only. Switch lamps were never used. On the Gheringhap - Maroona system, trains always arrived into the left-hand road regardless of whether this was the straight road or the diverge. Thus the indications were:-

- * Facing to arriving trains, if the left hand road was the straight road - two green discs.
- * Facing to arriving trains, if the left hand road took the diverge - two yellow discs.
- * Facing to arriving trains, if the points had failed to reset and/or lock after the last trailing movement - two red discs
- * Facing to departing trains, with the points set and locked correctly for the next facing move - two white discs with a vertical black bar through each.
- * Facing to departing trains, to alert the departing train crew to the points not having reset correctly - two white discs with a horizontal black bar through each.

The speed laid down for departing trains splitting the points was 15 mph. As a junior Driver transferring to Ararat in 1979, I was advised by an old hand to adhere pretty closely to this speed when it was cold. Anything much faster than this and the sluggish hydraulic fluid in the ram could not cope and there was a real danger in popping the end out of the ram!

Trailable points: Ararat - Portland

The program of installing trailable point crossing loops at 10 locations on this line heralded several changes from the original Gheringhap - Maroona system.

On this line the dictum was trains will always arrive into the left-hand road and the left hand road will always be the diverge. On a straight section of line this would obviously be no problem at one end of the loop. However, to accommodate a left hand diverge at the other end required a right-curving "chicance" in the main line just before the left hand points!

The other change in this system was the use of Union Switch & Signal Co trailable point operating mechanisms which were less complex in operation than the ones used on the Gheringhap - Maroona line. These allowed a trailing departure speed of 40 mph. Switchstand indications were all discs, the same as used on the Gheringhap - Maroona system with, of course, no requirement for two green discs.

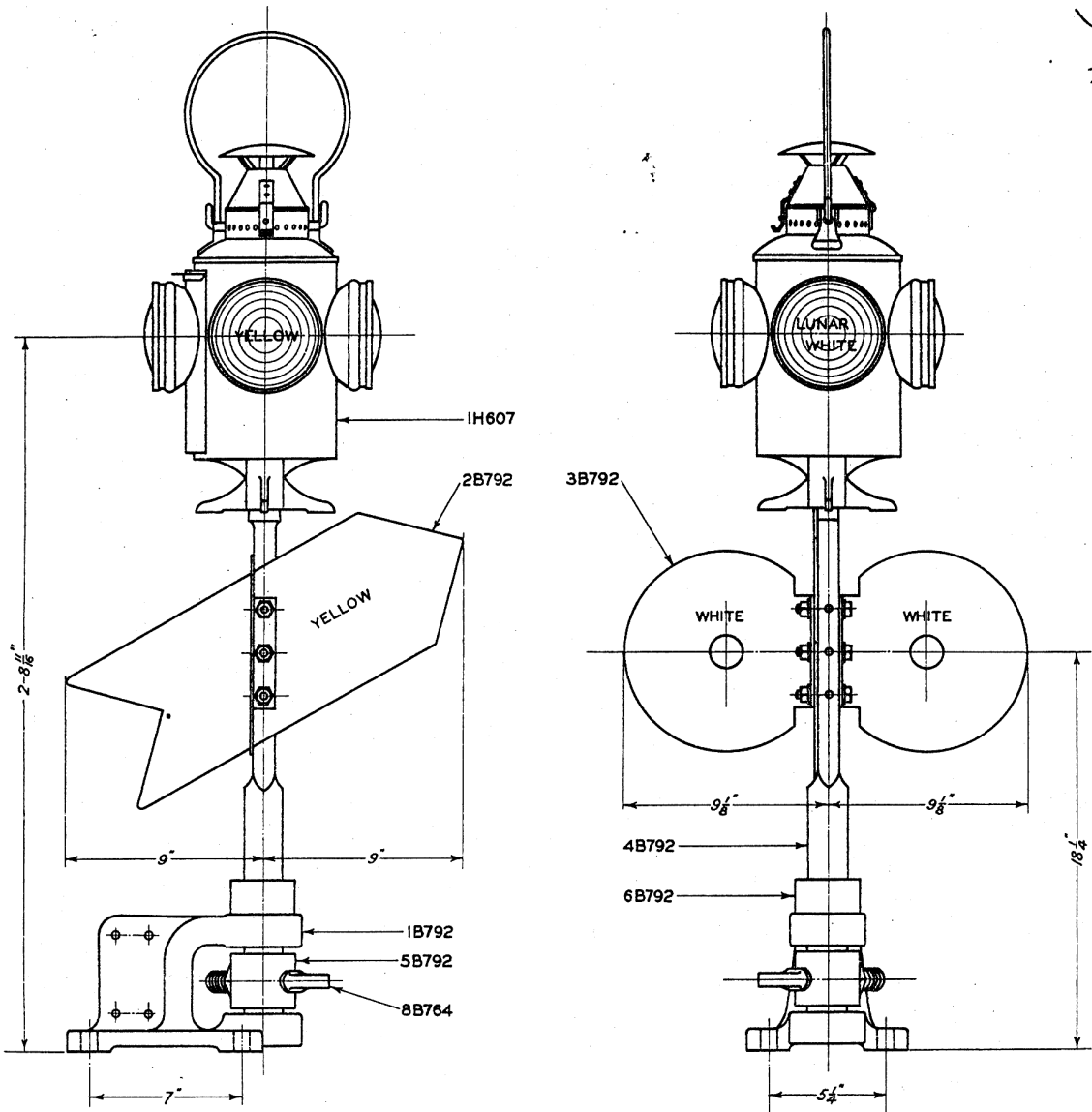
Shortly after the introduction of the trailable point crossing loops on this line it became apparent that the switchstand discs were breaking off due to the higher departure speed allowed. As with the Gheringhap - Maroona switchstands, all four discs were made from 1/8" aluminium sheet and separately bolted onto the stand. There was insufficient flexibility in the aluminium to prevent cracking from the repeated sudden "twanging" around of the switchstand as trains trailed out of the loops at up to 40 mph. Consequently an improved banner was devised very early in the piece. It was constructed as a one-piece unit of some sort of moulded pliable black plastic with reflectorized indications stuck to the different faces.

At the same time the indications were altered to a yel-

The trailable points at the Up end of Inverleigh in 1995 just before the line was converted to Standard Gauge. The two vertical black bars on the back of the switch stand targets clearly indicate to the Driver of a train in the loop that the points are set and locked for the main line. The complexity of the equipment needed to operate the trailable points is to be compared with the modern neat and compact trailable point machines shown on the following pages.



H 620



SWITCH STAND COMPLETE 1H620.

PART NO.	NAME	MATERIAL	QUANTITY
1B792	STAND	C. I.	1
2B792	ARM	ARMOR'L.	1
3B792	TARGET	" "	2
4B792	SHAFT	M.S.	1
5B792	COLLAR	M.S.	1
6B792	COLLAR	M.S.	1
8B764	CRANK ARM	M.S.	1
STOCK	BOLTS 5/16" DIA. 2 1/4" LONG WITH		
	LOCK NUTS & LEAD WASHERS	M.S.	3

NOTE LAMP TO BE ORDERED SEPARATELY.
FOR CIRCUIT CONTROLLER SEE DRAWING F2831.

1-75
57-1
3480

RECORD PLAN
R 3480
3 3/4" x 5 1/2" 37
J4-1

VICTORIAN RAILWAYS
SWITCH STAND
(LOW TYPE)
ASSEMBLY

SIG. & TEL. ENGINEER
DRAWN BY S.C.O.
TRACED BY M.S.C.
H620

SCALE 3/4" = 1 FT. 18-10-32.

7/20 7/20



(Left) The assembly drawing for the Victorian dwarf switchstand H620. This was produced for use where a switchstand had to be located between two tracks and, as far as is known, was only used at the Up end of Moe. The drawing is dated 18 October 1930 and no amendments have been subsequently made. (Above) The Down end trailable points at Carwarp on the Mildura line. The trailable points on this line are equipped with switchstands that show an arrow when the points are set and locked for a train to arrive. The loops are arranged so that Up trains (i.e. loaded grain trains) arrive into the straight road. Straight moves are indicated by a green arrow, as shown here. Down trains arrive into the loop and this is indicated by a yellow arrow. (Below) The Up end trainable points at Talbot, again on the Mildura line. The trailable point machines on this line are Westinghouse Type S21M which were developed from the US&S Type S21 machines. These machines can be trailed at speeds up to 80 km/h. The banner indicates the position of the plunger lock and when plunger is withdrawn from the lockbar shows two red discs - as was occurring at Talbot when this photo was taken.



low fish-tailed arrow inclined at 45 degrees upwards and two horizontal red discs. The rear of the banners remained as before - white with a vertical black bar and white with a horizontal black bar respectively.

The first application of this altered switchstand indication appeared at the Ararat end of Jacksons Loop and it would have been less than one week old when I took slides of it on 5 July 1986. A circular did come out detailing the new indication. I have it... somewhere!

Trailablepoints: Ballarat - Mildura

The advent of trailable point crossing loops on this line commencing in 1987 saw yet another variation. The dictum this time was that all Up trains (considered to mostly heavily loaded grain trains) would take the straight road. Again US&S trailable point mechanisms were used incorporating the plastic arrow/dumbbell moulding, but with slightly altered indications. This time all Up trains face green fish-tailed arrows, pointing left or right depending on which is the straight road, and all Down trains a yellow arrow in the loop.

Commonwealth Railways

As previously noted, Commonwealth Railways appear to have come into use with the introduction of Train Order working across the transcontinental east-west line in the early 1960s. Contradictory evidence as to another date is most welcome. These switchstands only ever had reflectorized indications:-

- * Points set for the mainline - green fishtailed arrow inclined at 30 degrees
- * Points set for the siding - two horizontal red discs

These arrows and "dumbbells" were to the same dimensions as used on S.A.R. switchstands, however around the early 1970s "jumbo" versions began to appear. The banners are in the same proportions but of much larger dimensions; presumably to increase the distance at which they may be seen. My personal nickname for them is "Nullabor" switchstands, as I imagine that they would be of greater value out there on the plain on black nights!

With the creation of Australian National Railways former S.A.R. switchstands indications were transposed onto former Commonwealth infrastructure and can now be seen all over what was formerly Commonwealth Railways lines.

Footnote

The trailable point crossing loop at Korong Vale, with its yellow arrow at each end is actually Jacksons Loop fully relocated. This followed a rationalization of every second crossing loop on the Ararat - Portlan line.

I am indebted to Jack McLean for providing me, some years ago, with a list of Double Wire installation locations and dates and also an actual photocopy of the instructions in Weekly Notice 42/29 which include diagrams of the switchstand in both its positions.

BUT WAIT! I KNOW YOU WANT MORE!

AN dual gauge switchstands

In addition to the indications described in the S.A.R. section previously, there is the dual gauge switchstand where broad and standard gauge lines converge. Standard hand operated switchstands at certain locations are used to operated these points and the indications on the banners are a white reflectorised BG or SG on a black oblong to indicate which gauge the points are set for.

National Rail - Melbourne Yard

National Rail, in their early days in Victoria in the 1990s, installed ex-S.A.R. hand operated switchstands at three or four sets of points under their jurisdiction within Melbourne Yard. It appears that this move was not the forerunner of a wholesale introduction of switchstands on National Rail tracks in Victoria, but merely the whim of one or two National Rail sub-management personnel. I believe these switchstands bear non-standard S.A.R. type indications and are unpopular with Shunters and Train Crews. This unpopularity stems from the fact that they are something foreign to Victorians who are used to yard points which can be trailed through. It appears that there have been numerous cases of locos accidentally trailing through the points when they are set reverse consequently causing damage to the rodding.

Australian Rail Track Corporation

The interstate standard gauge main lines out of Melbourne to Sydney and Adelaide were handed over to this corporation during the later part of the 1990s and it is the Newport to Ararat section of the Adelaide line which concerns us here.

V/Line invented the Section Authority Working electronic safeworking system and its adjunct DICE (Driver Initiated Control Equipment). Upon handover of the Melbourne to Wolsley line to ARTC, that corporation also purchased the rights to operate both ASW and DICE on the Newport to Ararat section.

DICE is an electronic system of point operation which is activated by the Driver of an approaching train through in-cab equipment. Crossing Loops on this section of the line are protected by Arrival Home signals working with US&S non-trailable point machines. Attached to these point machines are arrow and dumbbell switchstands. An approaching Driver with "DICE" himself into either No 1 or No 2 road depending on instructions from Control. The points will run remotely for the intended move and the appropriate Home Arrival light signal will clear. This is the only indication a Driver receives to allow him into the loop. There are no indications from the switchstand as the two sides of the arrow and dumbbell banners facing arriving trains are black. At the departure end of the loop reflectorised banner indications are displayed to departing trains to indicate which road the points are laying for. The Driver of a departing train will obtain an Authority from Control and "DICE" themselves out of the loop. The points will run and the only indication to the Train Crew is the display on the switchstand.

These switchstand indications have reverted to the original Double Wire ones of 1929! That is:

- * Points lying for the straight road - two horizontal white reflectorized discs.
- * Points lying for the diverging road - a yellow reflectorized fish-tailed arrow inclined at an angle of 30 degrees and pointing in the direction of the diverge.

As noted above, these indications are for departing trains only, arriving trains only see either a black arrow if the points are lying for the diverge or black "Mickey Mouse ears" if lying for the straight.

SAR type switchstand indications may also be seen on ARTC points in Victoria at Ararat and Gheringhap and are attached to non-trailable point machines. At Ararat they control access to the Ararat yard (and Maryborough line) and at Gheringhap a single yellow disc/white square indication on the switchstand controls access to the standard gauge ballast siding.

SEMAPHORE MASTS IN VICTORIA

Andrew Waugh

A chance question from Arthur Brooke during the Showday tour about semaphore masts prompted me to organise some of the information I have about the development of semaphore masts on the VR. As with most such questions, exploring the question merely highlighted how little I know and so the following can be regarded as the first step in a full history.

The first semaphores

Photographic evidence suggests that the first semaphore masts were closely modelled on contemporary English masts. The station semaphores were tall masts, apparently wood, with a opening at the top in which two arms worked in three positions. No contracts are known for their erection so it appears likely that they were constructed with each station.

The first recorded contract for semaphores was gazetted on 18 October 1867 for 'Construction and erection of two wrought iron semaphores' at Essendon Junction. The contract was for £219.4.4 and was carried out by Enoch Chambers. This was clearly related to the rehabilitation of the Essendon line and was probably the first signalling alteration to an existing location.

On 20 September 1872 a large contract (£2,407.16.0) was gazetted for 'Semaphores' on the NE line to David Edwards. The size of this contract suggests that this was for all the semaphores on that line. No material or design is mentioned in contract summary published in the gazette.

Cast Iron Masts

The next two contracts were gazetted on 8 August 1873. These specified the 'supply of cast iron semaphores' and were both let to Thomas Tozer. The first, for £800.0.0 was charged to Vote 73 of 1873/4: 'Erection of semaphore at various stations'. The second was charged to 32 Vict 331, Schedule 2, Item 1 and was originally for £1315.0.0, but was subsequently increased by £510.9.5 on 28 May 1874. The concept of a cast iron semaphore mast is curious as a tall cast iron post would seem to be both excessively heavy and brittle. I have not seen any photographs or drawings of these masts, but I would imagine that they would look something like standards for gas lights and would be quite short.

A further contract of £216.17.6 was gazetted for 'Semaphores for [Wangaratta - Beechworth] Railway' on 24 September 1875. This contract was carried out by Langlands Foundry Coy and so the masts were likely to have been cast iron, but the contract does not say so. The next contract was different. It was gazetted on 11 August 1876 and required the supply of 'Semaphore fittings' for Melbourne station. The contract, for £138.17.6 was let to Robinson Brothers & Co.

The next contract marked a return to cast iron masts. It was gazetted on 22 March 1878 and was for the 'Making of 60 cast iron semaphores etc'. Thos Tozer once again carried out the work, this time for £1894.19.5. This meant that each semaphore cost roughly £38. Two years (9 January 1880) Thompson & Co were granted a contract for the manufacture of 50 cast iron semaphores for £1244.7.0 (about £25 each). The last contract for cast iron semaphores was gazetted on 25 February 1881 for the manufacture of 20 cast iron semaphores. The contract was let to Thompson & Co and was charged as follows: Dunolly - St Arnaud £41.11.3; Carlsruhe - Daylesford £41.11.3; South Yarra - Oakleigh £20.15.7; and Oakleigh - Sale £311.13.11. This probably represented

2 posts for the first two lines, one post for South Yarra - Oakleigh, and 15 for the Oakleigh - Sale line.

Wooden Masts

While these cast iron masts were being erected, McKenzie and Holland were erecting far more conventional wooden masts for the Victorian Railways

The first location interlocked was Essendon Junction which was brought into service 1 July 1876. Colin Rutledge has found a lengthy description of this installation in the Argus. The semaphore masts were described as follows:

They are of Oregon pine, of various lengths up to 50 ft., and are cased in red gum planking 3in. in thickness to a height of 3 ft. above the surface of the ground. They are supported by red gum sills of 12 ft. by 12 ft., firmly rammed into cruciform excavations of 5 ft. in depth. (reprinted in Somersault Vol 9 No 2)

In addition to their work installing complete interlocked locations, McKenzie and Holland were granted a contract on 27 February 1880 for the supply of interlocking apparatus for the Springs - Wahgunyah line, the Geelong - Queenscliff line, and the Goulburn Valley lines. In each case the amount was fairly small (£49.19.3). Each probably represents the provision of signalling at the junction and, since the junctions were not interlocked at the time, probably represents the provision of signals.

From the middle of 1881 a change occurred in the purchase of signals. Instead of purchasing cast iron masts, the railways began to purchase semaphore fittings and, presumably, began to attach them to wooden masts. The first such contract was gazetted on 30 June 1881 to Phillip Bevan for the manufacture of semaphore fittings with lamps etc. The cost (£151.6.10) was charged to the Williamstown Junction - Ballarat line. Thompson & Co won the second such contract (for the manufacture of semaphore fittings only) on 3 February 1882. The contract costs were charged in the following ways: Ballarat - Ararat £18.3.2, Oakleigh - Sale £36.6.4; Ararat - Stawell £18.3.2; NE line £63.11.1; and Shepparton - Numurkah £72.12.8. Two contracts for the manufacture of semaphore fittings was gazetted on 12 May 1882. The first was to J.E. Rillstone for £410.13.4. The second, which included lamps, was for £448.2.3 to George Couch. A fifth contract was let on 25 August 1882 to McKenzie and Holland for £797.10.0 (this was separate from the contract gazetted the same day to McKenzie and Holland for the supply of interlocking point and signal apparatus). The sixth contract was for the manufacture of semaphore fittings and levers, gazetted on 9 May 1884 to A Lugton and Sons for £419.7.6. A seventh contract, again for the manufacture of semaphore fittings and levers was gazetted on 19 September 1884 to Howard and Dalton for £398.15.0.

On 17 July 1885 a contract for manufacture of semaphore fittings was gazetted to G Couch for £435.17.6. A copy of the contract drawing has survived (see Somersault Vol 14 No 4) and this shows the semaphore arm mounted on a wooden post. The post is 7" square at the top and is surmounted by the classic McKenzie and Holland finial. The lithographic drawing was dated September 1883 and, presumably, was used for all such contracts after this date.

A similar drawing, this time showing a somersault signal, was produced in August 1886 and was used to tender for the supply of 50 sets of semaphore fittings. G Couch won the tender on 8 October 1886 with a bid of £580.2.6. Again

Wooden Semaphore Mast Contracts 1901-8										
Contract Date	Contractor	Cost for contracted lengths								
		28'	30'	33'	35'	38'	40'	43'	48'	56'
18.01.01	AC Brabet & Co		2.17.0	3.3.6	3.9.0	3.15.0				
16.08.01	AC Brabet & Co	2.12.10	2.15.0	3.1.2			4.2.4	4.12.0		6.5.0
14.05.02	AC Brabet & Co	2.12.0	2.13.0	3.1.0	3.5.0	3.10.0				
08.04.03	AA Cunningham	2.5.0	2.8.0	2.13.0		3.1.0		3.10.0		
26.07.05	Parker Bros	2.5.0		2.15.0		3.0.0				
22.11.05	AC Brabet & Co	2.9.4		2.15.2		3.7.0				
02.05.06	AC Brabet & Co	2.9.4		2.15.0	3.5.0	3.7.0		4.10.0		
09.01.07	Jas. Callinan	2.10.0		3.0.0	3.7.6	3.14.6		4.9.0	4.18.0	
10.07.07	AC Brabet & Co	2.12.2	3.1.8	3.1.8		3.14.6		4.18.2		
04.12.07	AC Brabet & Co	2.12.4		3.1.8	3.15.6	3.19.0		4.19.0		
26.08.08	R Bulmer	2.11.4		3.3.3	2.10.2	3.19.2		5.0.4		

the drawing shows a wooden mast 7" square topped with a McKenzie and Holland finial.

The first general contract held by McKenzie and Holland for the supply of signalling equipment was gazetted on 6 August 1887. The contract gave prices for the supply of ironwork and fittings for single armed signals (two variations), and 2, 3, 4, 5, and 6 armed bracket posts. The ironwork and fittings actually supplied was amplified by a list of parts: bracket arms; spindles; bushes; arms; lamp; adjusting screws etc. It is clear from this that the wood for the actual mast itself was supplied by the VR. This was still the case for the last general contract held by McKenzie and Holland in 1902 where the schedule gave prices for individual components of a signal and sets of components, but not for complete signals. One interesting feature was the three separate entries for 'semaphore tops' (finials): small; medium; and large pattern. The size probably referred to the size of the post fitted.

The table at the top of the page gives the costs of semaphore masts between 1901 and 1908. The costs are taken from the details in the Government Gazette. When comparing the length of the masts given in this table with the height shown in other tables remember that the length would be the total length including the section below ground and the section above the topmost arm. The contract summaries include a few other details not shown in the table. Until the contract of 26.07.1905 the semaphore masts were specified as 'Red Ironbark'. After this date the timber was not specified. Until the contract of 2 May 1906 the delivery location was specified; this was at Bairnsdale (either at the station yard or the wharf) for all contracts except that of Parker Bros which was for delivery to Rushworth.

Contracts for the supply wooden semaphore masts cease in 1908. This could indicate the end of erection of this type of masts as new.

A page in a calculation book, drawn up around the beginning of 1912, gives some details of standard wooden masts.

Costs of Wooden Masts					
Length above ground	Dimensions		Cost (dressed and painted)		
	Top	Butt	Labor	Mat	Total
			L.s.d	L.s.d	L.s.d
15'	9" x 9"	12" x 12"	3.0.0	2.15.0	5.15.0
20'	9" x 9"	12" x 12"	3.18.0	3.3.3	7.1.3
25'	9" x 9"	12" x 12"	4.19.0	3.14.0	8.13.0
30'	9" x 9"	13" x 13"	5.10.6	4.17.0	10.7.6
35'	9" x 9"	13" x 13"	6.10.0	5.17.6	12.7.6

The use of high quality Australian hardwood for semaphore masts meant that wooden masts often had a long life. Once consequence of this was that wooden masts were re-located leading to the appearance of 'new' wooden masts long after 1910. For example, Post 28, the well known wooden bracket Up Homes from the Hurstbridge line at

Clifton Hil, was provided in 1920. The chronological index held by the mechanical interlocking section suggests that Post 13 at Cressy was renewed with a 20' wood mast as late as 1950.

Lattice Masts

Riveted lattice masts appear to have been introduced around 1910. Drawing N21 titled 'Standard 20' Home Signal' was signed by F.M. Calcutt on 6 September 1911 and shows a lattice mast (with a wooden arm, short finial, and old style lamp case).

A page in the calculation book drawn up at the beginning of 1912 gives a comparison of the costs of wooden and lattice mast:

Costs of Lattice Masts vs Wood Masts					
Length above Ground	Weight without concrete	Lattice Mast Cost (ironwork only)			Wood Mast Cost
		Labor	Mat	Total	
		L.s.d	L.s.d	L.s.d	
15'	340lbs	3.0.0	2.8.6	5.8.6	5.15.0
20'	380lbs	3.6.0	2.11.0	5.17.0	7.1.3
25'	470lbs	3.11.0	2.13.6	6.4.6	8.13.0
30'	1000lbs	4.15.6	4.2.6	8.18.0	10.7.6
35'	1130lbs	5.0.0	4.5.0	9.5.0	12.7.6

The table shows that lattice masts were cheaper than wooden masts. The price difference was not large with the shorter masts, but tall lattice masts were significantly cheaper than wooden masts. This probably reflected the relative rarity of suitable timber for the tall masts.

Other drawings exist from this period and show lattice masts. These include A114, dated 12 April 1910, which shows a lattice breast for a triple doll bracket.

There were probably other drawings, including detail drawings of lattice masts, but I do not have copies. Alternatively, it is possible that the masts were made up in the Signal Workshops using jigs and detailed plans were not deemed necessary.

Very large number of lattice masts were erected during the first half of the 1910s as a large number of locations were interlocked, had their yard extended, or were plunger locked.

Manufacture of lattice masts was still continuing, or had been recommenced, in early 1941. On 1 March of that year a series of drawings were issued showing lattice signal posts. This series was lead by B939 which showed the typical assembly of a straight lattice mast. The masts themselves were detailed on B938 which showed three types of masts: one for masts between 15 and 24 feet high; the second for masts between 25 and 29 feet in height; and the third for masts over 30' tall (the height in all cases is from the top of the foundation to the centreline of the topmost arm). Similar drawings were issued on the same date for lattice bracket masts: B800 (breast for lop brackets); B801 (breast for balanced bracket); and B803 (bracket mast and dollies).

Production of lattice masts appears to have ceased around 1950 when they were replaced by welded batten masts for new work. However, like wood masts, redundant posts would have been reused after this date.

Pipe Masts

Pipe masts appear to have been introduced into Victoria with the provision of power signalling at South Yarra in 1915. Power signalling technology was American and the surviving plans of that date (F74 and F83 showing a signal mast bases for 5 1/2" and 7" pipe masts respectively) were explicitly based on RSA drawings.

Some thought appears to have been given, however, to mounting the upper quadrant semaphores on lattice masts. A page in the calculation book dated 4 August 1914 gives a comparison of the estimated cost of lattice and pipe masts. The result was a clear win for pipe masts with the mast being roughly half the cost of an equivalent lattice masts:

Cost of Lattice Masts vs Pipe Masts 1914

Height	Lattice (L.s.d)	Pipe (L.s.d)
20'	6.13.9	3.12.6
25'	7.16.6	4.9.0
30'	10.0.0	5.2.9

Large scale production of pipe masts appears to have commenced around 1917. A large number of drawings were produced in this year including F144 (Signal Masts) dated 8 August 1917, B97 (Two arm straight mast) dated 25 August 1917, and B99 (One arm straight mast) dated 5 October 1917. Similar drawings were produced at the same time for the lop bracket masts used in power signalling areas. These featured a massive lattice mast and bracket with a pipe dolly. None of these drawings, however, gives any indication that they could be used for mechanical signals.

The first evidence of a mechanical signal mounted on a pipe mast is drawing B614 which is titled 'One armed semaphore signal (pipe mast)' and is dated 18 November 1926. A note on B614 limits the height of the mast to less than 23' 6". Taller posts, presumably, continued to be of lattice construction. Why this was so is not clear; if a pipe mast could support the weight of a signal motor surely it would have no problem supporting the mechanical semaphore fittings. Drawing B614 showed at least one idea that was, we believe, never used: the mounting of the lever plate and reverser immediately below the arm (NSW style) instead of at the base of the post.

Perhaps the first example of this new type of mechanical mast was provided at Anstey in January 1927 when the gates were interlocked. This was Post 33B, the Down Home protecting the gates. Relatively few examples of mechanical pipe masts were erected, of course relatively few mechanical signals were erected at all in the late twenties and thirties. They were still being installed just before the war: the pipe masts for the co-acting Down distant signals at Kilmore East were provided in October 1938.

As discussed early, 1941 saw the issue of new drawings for the rivetted lattice mast. This, presumably indicates the abandonment of the pipe mast for mechanical signals. I wonder if it was easier to get angles and flats than pipe in Australia during the war?

Light signals, both two and three position continued to be mounted on pipe masts and this continues to this day.

Batten Masts

Batten masts appear to have been introduced around 1950.

although I have not seen a drawing for the straight mast. An inspection of the chronological index for that era suggests that a large number of masts were renewed in the '50s and '60s and it could have been that something easier and cheaper to fabricate was desired when compared with the rivetted lattice.

A lengthy set of calculations was begun on 16 April 1953 on the comparison of welded batten construction of bracket masts versus rivetted lattice construction. The design work eventually concluded in August. This showed that the batten mast was heavier (34 lbs per foot versus 32 lbs per foot for the lattice mast) but was stiffer and so was suitable for a maximum height of 26' without reducing loading. The mast was also suitable for galvanising. The comparison of a symmetrical breast showed that the batten design was marginally heavier (273 lbs vs 243 lbs for the lattice). However, it was simpler to produce as only 4 members required setting (versus 6 in the lattice breast), there were no reentrant angles to hold water, the bracket was suitable for galvanising, and all notching could be flame cut and welded over without further preparation of the joints. The lop sided breast was similar - slightly heavier (437 lbs versus 421 lbs), but with a much smaller number of members (32 versus 45).

Pages in the calculation book dated 1 June 1954 give calculations for the design of a 35 foot straight batten mast. This design explicitly references the existing type as B938 (i.e. a lattice mast).

Installation of batten masts continued into the seventies, and possibly even the eighties. Post 45 at Coburg, for example, was renewed as two batten masts in 1973.

Conclusion

From all this rough construction periods can be assigned as follows.

Wooden three position semaphores appear to have been only erected as new work for a short period during the construction of the Melbourne - Sandhurst - Echuca and Geelong - Ballarat lines.

Cast iron posts were provided between 1873 and 1881, however not exclusively.

Wooden two position posts began to be erected on a large scale in 1876 with the provision of interlocking. General provision of wooden masts appears to have started in 1881 and continued to around 1910.

Rivetted lattice masts began to be provided around 1910 and these were the standard mast for mechanical signals until 1927. After this short straight masts and dolls began to be made from pipe masts, but it appears that lattice masts staged a comeback in 1941 until replaced by batten masts in the early '50s.

Pipe masts were introduced in 1915 with the power signalling at Caulfield, and came into wider use around 1917 as power signalling was extended. Pipe masts became, and remained, the standard post for power signals, both semaphore and light. Pipe masts began to be used for the shorter mechanical masts and for dolls on bracket posts and signal bridges around 1927, but relatively few were provided. From circa 1941 mechanical signals were once more mounted on lattice posts, and, later, batten posts.

Welded batten post began around 1950, initially with the shorter straight masts. Welded bracket posts were in 1953 and tall straight masts in 1954. Construction of batten posts continued until the installation of new mechanical signals ceased.

VICTORIAN SIGNALLING SYMBOLS

PART III - CROSSING SYMBOLS

This is the third part of a series that will explain the symbols used on Victorian signalling plans; both official plans and the drawings used in Somersault. Part I, covering signals, appeared in the May 2001 issue. Part II dealt with point and track symbols and appeared in the September 2001 issue. This part covers symbols used for crossings. Most such crossings are road crossings and most of the symbols deal with level crossing protection equipment. However, crossings may also be for foot crossings or watercourses.

Basic Road Crossings

Figure 1 shows the symbols used for basic road crossings; this is an area where the symbols used in the diagrams in Somersault differ from those used on formal diagrams as the official symbols take up significant amount of space.

The symbol for an open crossing is shown in Figure 1a. This is an entertaining symbol as the elements of the symbol represent features that no longer exist, and indeed most current staff would not even recognise. The long rectangles on each side of the crossing represent cattle pits or cattle grids; these have long since vanished from the non-preservation railways. The diagonal lines represent the wing fences. Traditionally, the road was much wider than the crossing itself and diagonal fences ran from the corners of the crossing to the fences on the boundary of the railway and the road. Again, these are non-existent these days. The symbol used in Somersault for a basic crossing is shown in Figure 1g; this has the advantage of using less space on the diagram. The symbols for open crossings are often combined with those for flashing lights and boom barriers.

Figure 1b is the symbol for a set of hand operated gates operated by a gatekeeper, while Figure 1c is the symbol for a set of interlocked gates operated by an adjacent signalbox. If the diagram indicate lever numbers, the gate wheel lever

is conventionally shown in the centre of the gate, while the gate stop lever is shown in the centre of each road side. Some attempt is often made with both hand and interlocked gates to accurately represent the position of the wing fences and they will often not be the nominal diagonal lines shown here.

Figure 1d is a bridge under the line; Figure 1h is the equivalent symbol used in Somersault. Figure 1e is a bridge over the line; Figure 1i is the equivalent symbol used in Somersault.

Figure 1f is a tramway crossing showing the tramway catch and tramway disc signals.

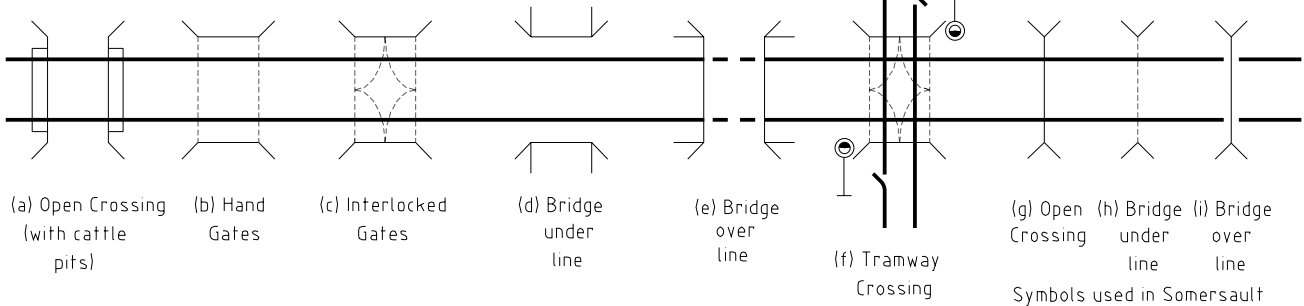
Wig Wags, Flashing Lights, and Boom Barriers

The symbols used for level crossing protection equipment are shown in Figure 2. All these symbols are based on the standard US symbols; reflecting the source of the technology.

Figure 2a is the symbol for a wig wag. Figure 2b is the symbol for a bell on a mast. In practice, a bell on its own is very uncommon and the bell symbol is usually combined with the symbols for flashing lights and boom barriers (see Figures 2e and 2f). Note that, although wig wags were fitted with a bell, the symbol for a wig wag does not include the bell symbol.

Figures 2c and 2d show a basic flashing light mast. Figure 2c shows a cross arm with two light units, while 2d shows a cross arm with four light units. A four light unit cross arm can show the flashing light signal along both road approaches and is standard. Two light units are provided where it is necessary to provide additional warning (e.g. where there is an intersection adjacent to the level crossing and additional cross arms are provided for cars travelling

Figure 1: Crossings



Continued on Page 96

Figure 2: Wig Wags, Flashing Lights & Boom Barriers

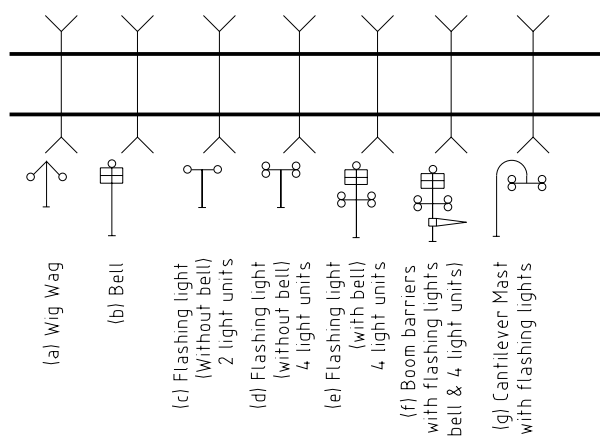


Figure 3: Pedestrian Gates

