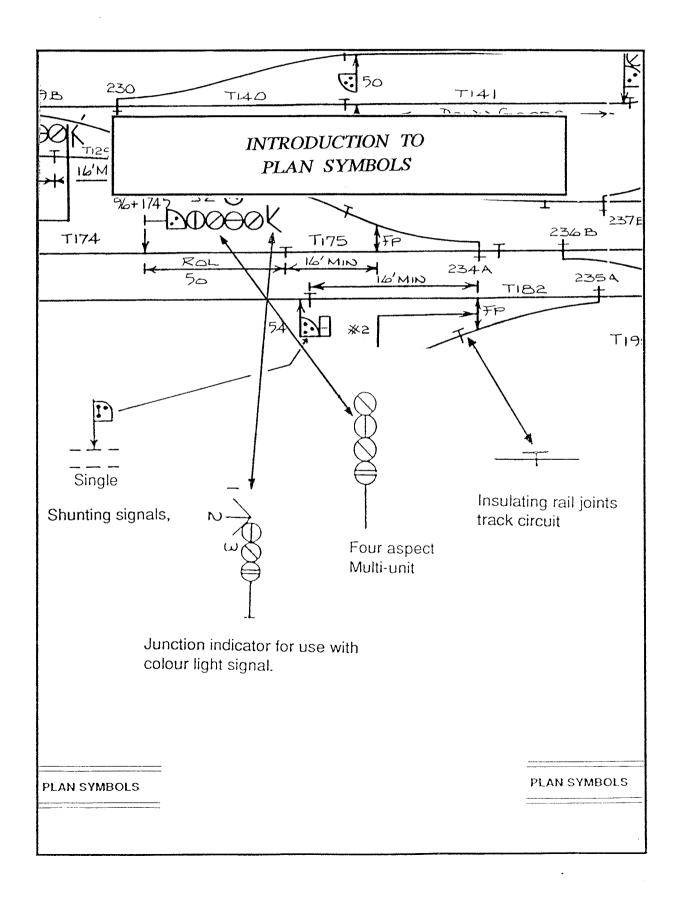
DIRECTOR OF S & T ENGINEERING. WEST MIDLANDS PROJECTS GROUP.



TRAINING MANUAL INTRODUCTION TO RAILWAY SIGNALLING

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INTRODUCTION TO PLAN SYMBOLS

British Standards Institution 376

It can be appreciated from the early days of railway signalling there has been a need for agreed standards of representation. It is most important that the interpretation of say a signalling plan is exactly the same for the design staff as it is for the installation staff. Today this is accepted as a matter of course but it must be remembered that a great deal of work by past Signal Engineers has been needed to bring about the British standards we now work to.

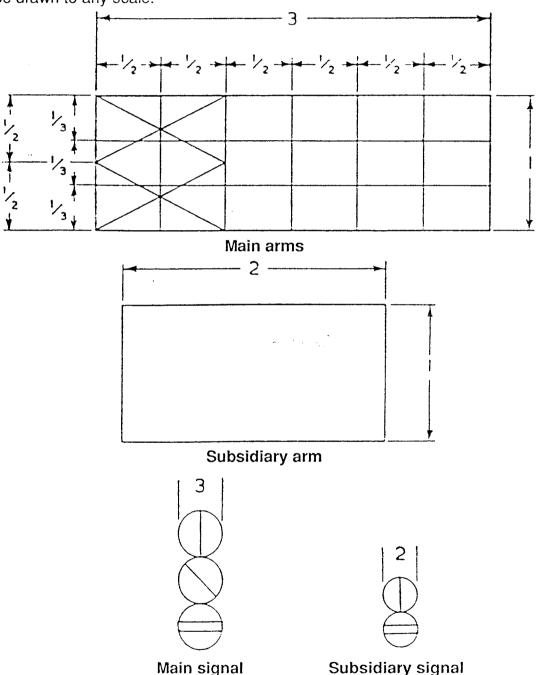
The standard most widely known and used is BS 376 Part 1. This British Standard is peculiar to railway signalling. One can see from this that a good knowledge of BS 376 is extremely useful but one must remember that other standards are used in the Department when necessary.

One of these other standards is Signalling Principle No. 51 and you should make reference to it, as it has symbols within it, which are supplementary to and where applicable supersede some of those shown in BS 376 Part 1.

BS 376 Part 1: 1951

Diagrams Showing Proportions of Semaphore Arms

NOTE. The following diagrams will assist in arriving at the correct proportions of semaphore arms, and illustrate the comparative sizes of main and subsidiary light signals. They may, of course, be drawn to any scale.



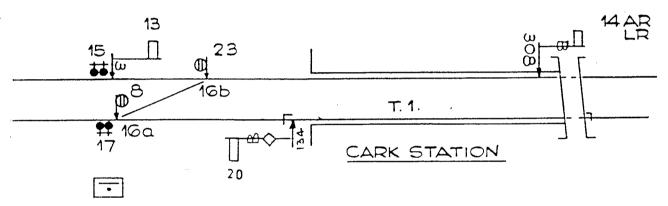
LIGHT SIGNALS

Symbols for short range signals should be two-thirds of the size of symbols for long range signals.

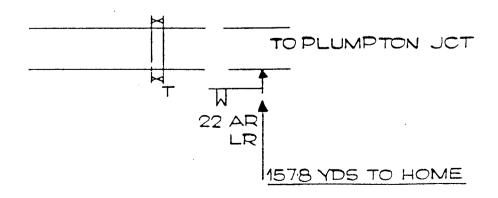
SECTION 1. SIGNALS

NOTE. Arms should always be shown in the normal position. Dotted lines may be used to indicate positions in which a signal can be operated.

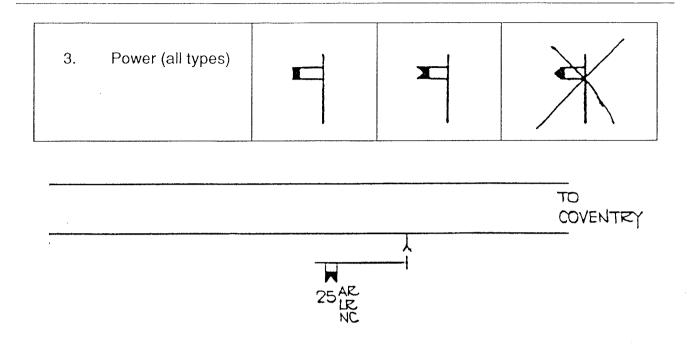
Туре	Stop signal	Distant signal	Permissive signal
1. Mechanical ordinary		Σ	

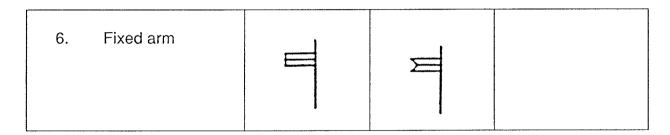


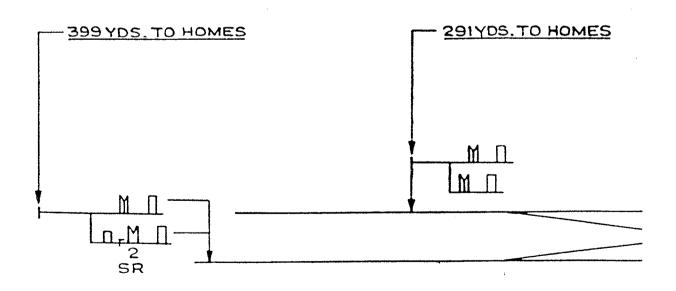
Cark Signal Box set of 30 Levers Working - 10 Spare - 20

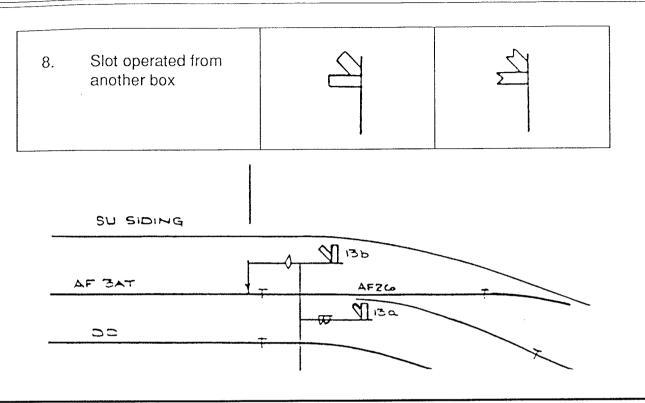


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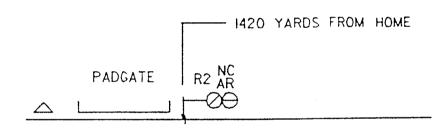


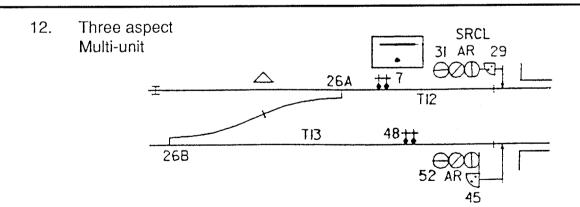






11. Two aspect Multi-unit



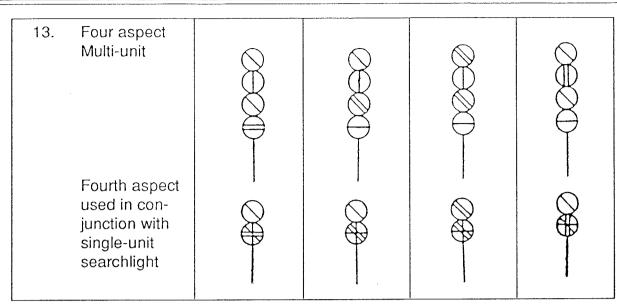


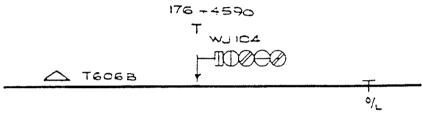
Single-unit searchlight





2 ASPECT



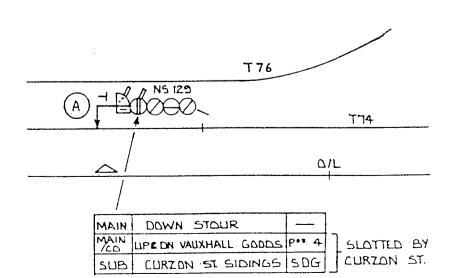


15. Slotted signals, colour light



or





17. Illuminated sign

NOTE. Legend displayed to be shown in circle



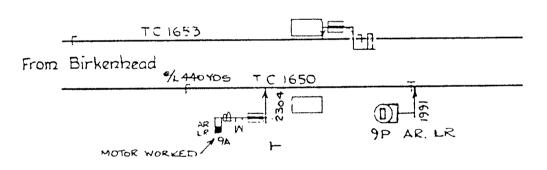
18. Traction system dead section indicator



19. Banner signal



MEOLS STATION

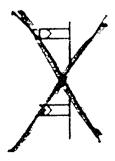


Meols I B. Section Signals

20. Repeater signals

Repeating stop signal

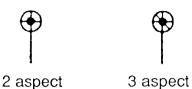
Repeating caution signal







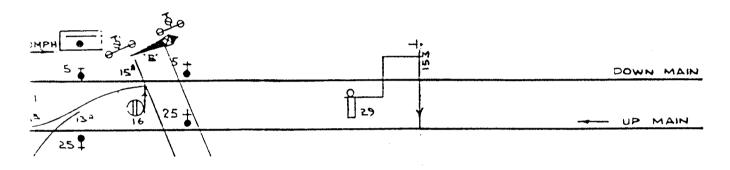
21. Fog repeater signals



22. Signal lamp-intensified light

If intensified lighting is used in conjunction with spectacle only, add the appropriate aspect symbols in the circle.

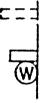




23. Subsidiary signals

The letter in symbol is that to be displayed,

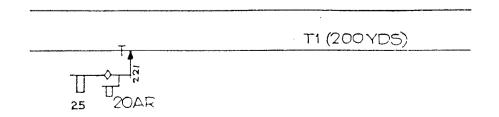
eg. C - Call on S - Shunt ahead W - Warning





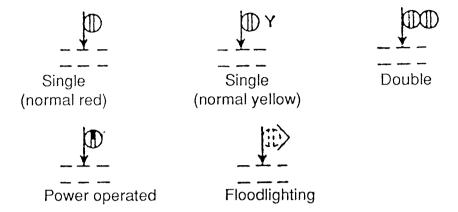






24. Shunting signals

Mechanical (disk or dwarf)

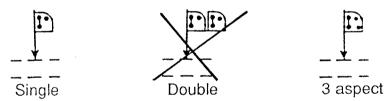


Shunting signals, colour light.

Indicate aspects as for colour light running signals but symbols to be smaller.

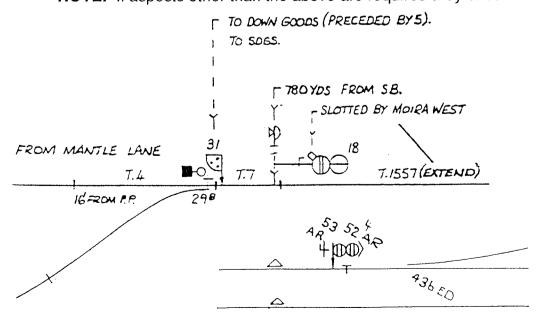
Shunting signals, position light.

In the absence of a qualifying letter the normal aspect is red/white. In other cases add appropriate letter, eg. 'Y' for yellow/white or 'W' for white/white.



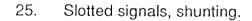
All examples - Arrow indicates line to which applicable.

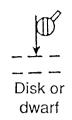
NOTE. If aspects other than the above are required they should be specified.

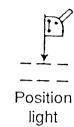


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INTRODUCTION TO PLAN SYMBOLS







31. Route indicator signal.

(Numeral indicates the total number of routes)

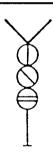


32. Route indicator signal, double sided.

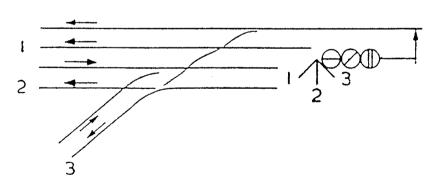


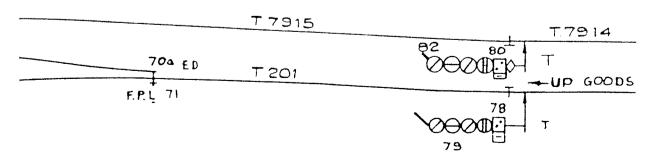
33. Junction indicator for use with colour light signal.



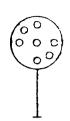


Example:



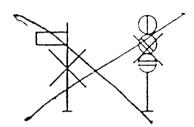


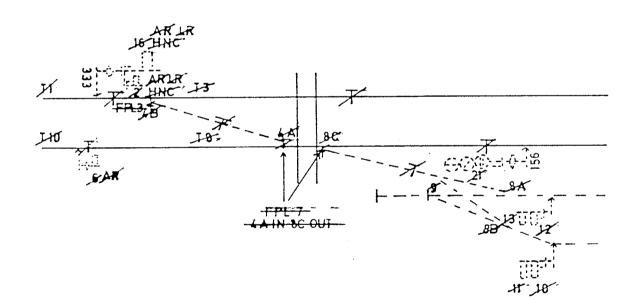
35. Shunting speed indicator (for hump yards, etc.)



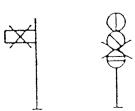
36. Signal to be removed.

SEE BELOW



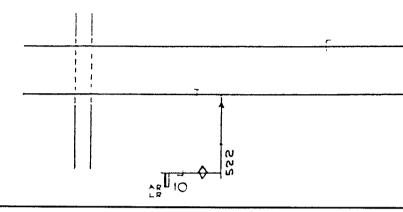


37. Signal not in use.

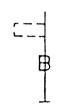


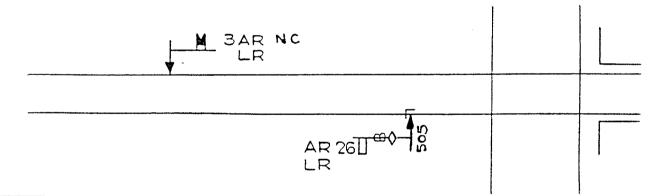
38. Signal, the lever of which is locked electrically, (other than Nos. 39, 40, 41).





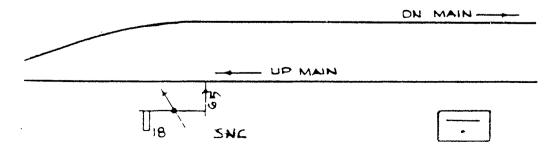
39. Signal, the lever of which is released by block at 'line clear'.





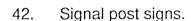
40. Signal, the lever of which is released by token.



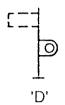


41. Signal, the lever of which is interlocked with key.

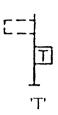








sign



sign

'Diamond' sign





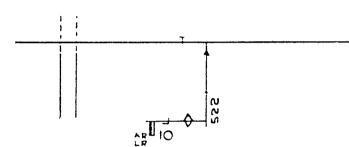
Combined Diamond and 'T' sign

Combined 'D' & 'T' sign

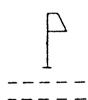
TO)

Automatic signal sign

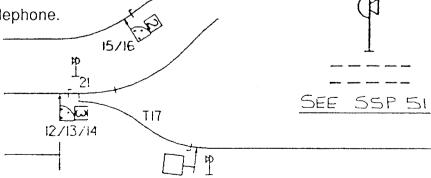
Semi-automatic signal sign



45. Fireman's plunger.

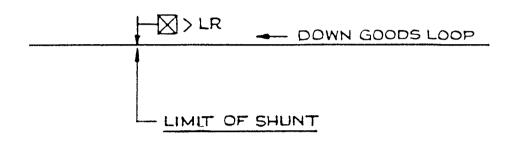


46. Ground telephone.



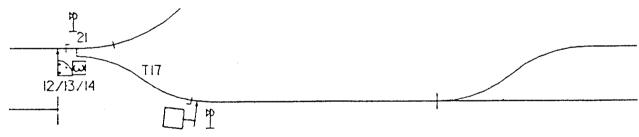
47. Limit of shunt signal.





48. Notice board, (wording to be stated).





"SCOTCHLITE" REFLECTORISED NOTICE BOARD WORDED 'STOP AND TELEPHONE"

49. Arm electrically indicated in signal box.

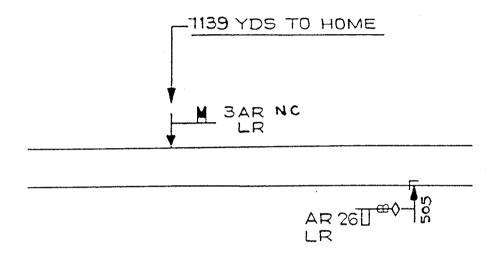
AREII

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INTRODUCTION TO PLAN SYMBOLS

50. Light electrically indicated in signal box.

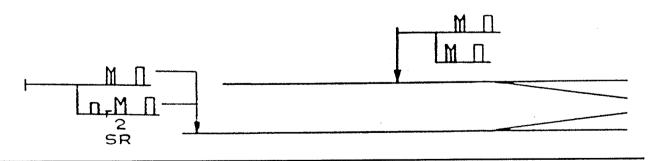




51. Slot indicated in signal box.

Symbols Nos. 49 - 50 and 51 can be used in combination, as required, for common repeaters.





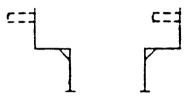
52. Arm and slot-on, slot-off, indicated in signal box.



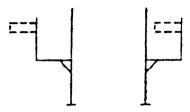
54. Straight post signal.



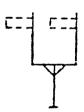
55. Half bracket.

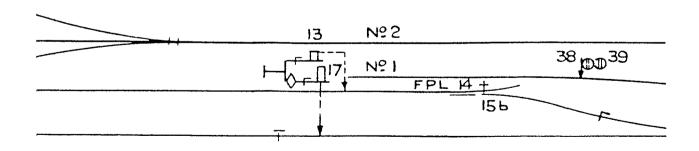


56. Side bracket on straight post.



57. Tee bracket.

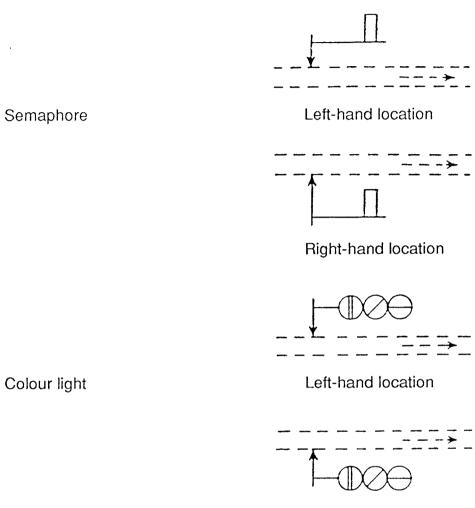




58. Suspended doll.

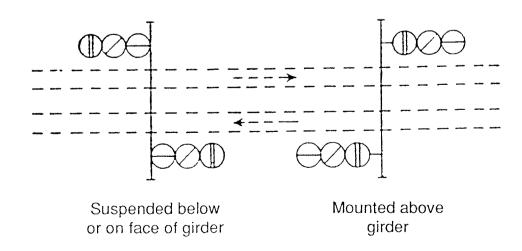


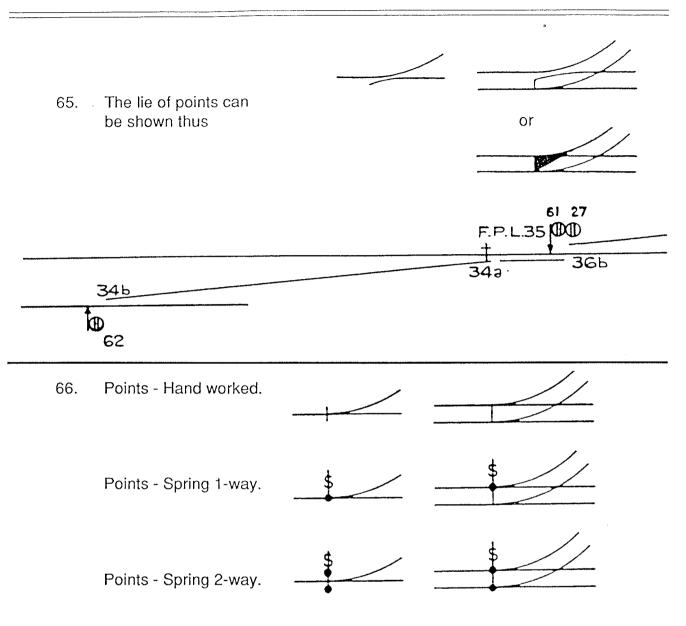
59. Relation of the signal to the track and the direction of traffic.

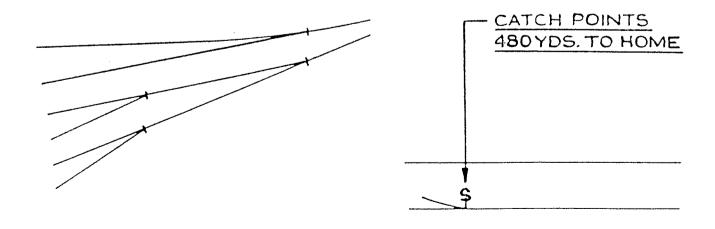


Right-hand location

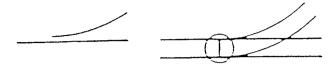
Colour light signal mounted on gantry or cantilever bracket spanning tracks.







67. Points worked from signal box.



Circle need not be used when points are numbered.

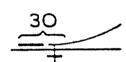
68. Points without lock with bar (1-lever).



69. Points without lock with bar (2-levers).

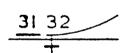


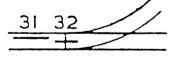
70. Points with lock and bar (1-lever).



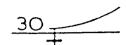


71. Points with lock and bar (2-levers).



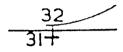


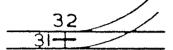
72. Points with lock without bar (1-lever).



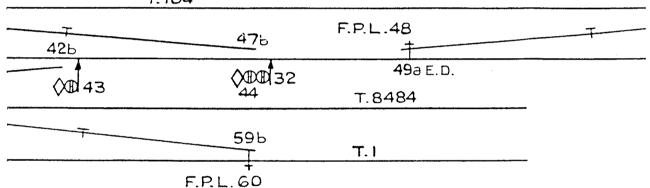


73. Points with lock without bar (2-levers).

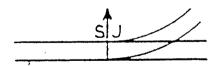


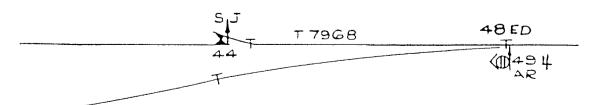


T. 104



75. Slotted joint control.

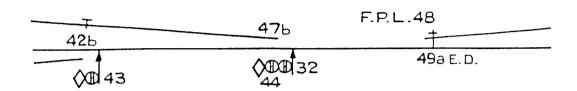


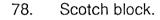


76. Detectors.

Indicate by table if required.

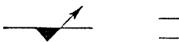
NOTE. The letters 'E.D.' adjacent to the points may be used to indicate electric detection.







79. Derailer.





(Arrow shows direction of derailment.)

80. Trap points, single switch.





With guard rail.

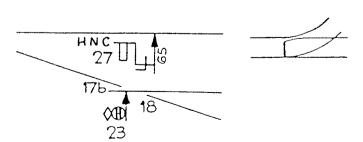


81. Trap points, double switch.



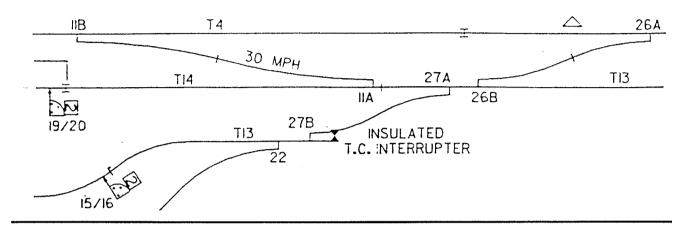


With crossing.

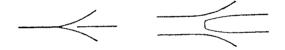


82. Track circuit interrupter at trap or catchpoints.





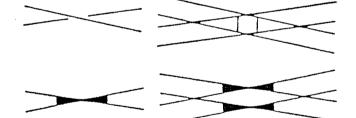
83. Trap points, wide to gauge.



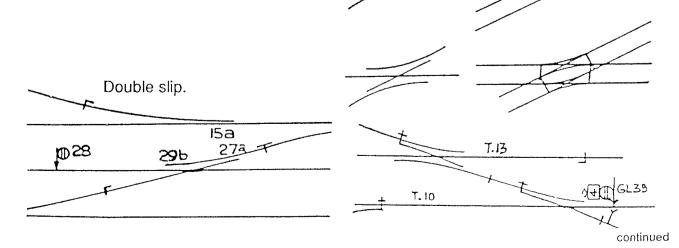
84. Moveable switch diamonds.

Diamond crossing

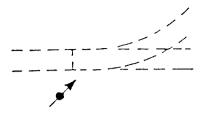
protectors.



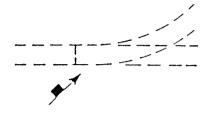
85. Single slip.



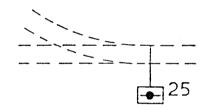
86. Released by token.



87. Released by key on token.

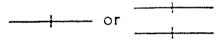


88. Released by key from signal box (Number shows controlling lever).

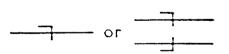


SECTION 3. TRACK DETAILS

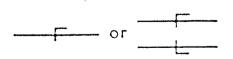
90. Insulating rail joints, track circuit in both directions.

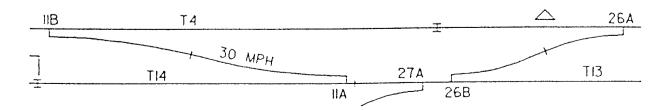


91. Insulating rail joints track circuit on left, none on right.



92. Insulating rail joints track circuit on right none on left.

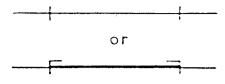




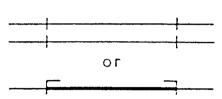
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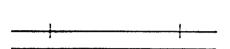
93. Track circuit portion (single line plans).

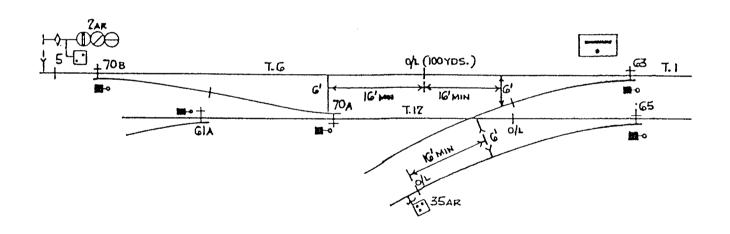


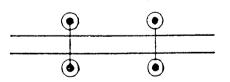
Track circuit portion (double line plans).



Single rail track circuit (on single line plans, suitable note to be added).

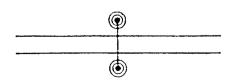






"In" or "out" Treadles.

94. Axle counters.

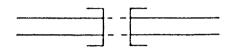


"In" and "out" Treadles.

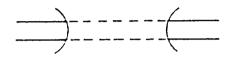
98. Traffic direction.



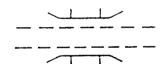
99. Overbridge.



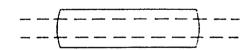
100. Tunnel.



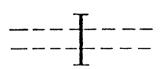
101. Underbridge or viaduct.



102. Bridge, moveable span.



103. Signal bridge.



104. Signal bridge and electric traction structure.

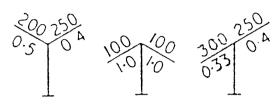


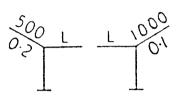
105. Mile Post

SEE SSP 51



106. Gradient posts
(Upper figures show lengths for unit rise or fall.
Alternatively, the lower figures, which show percentage values, may be used.)





108. Token receiver.



109. Token deliverer.



110. Token exchanger.

111.



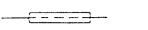
Single line

Single rail.

Car retarders.

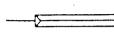
Double rail.

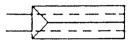
114. Sand drag or sanded track.



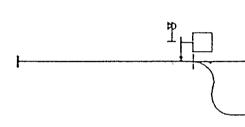
Length to be shown

Sand hump.



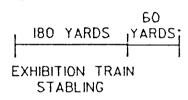


115. Buffer stop.

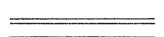


No. I SIDING

No. 2 SIDING



116. Mixed Gauge.

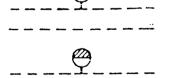


SECTION 4. APPARATUS

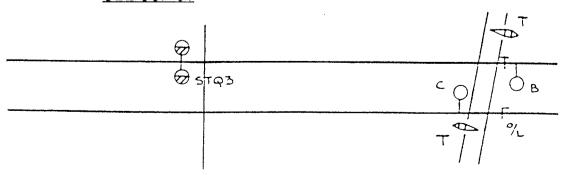
122. Treadle, electrical.

Contacts normally open.

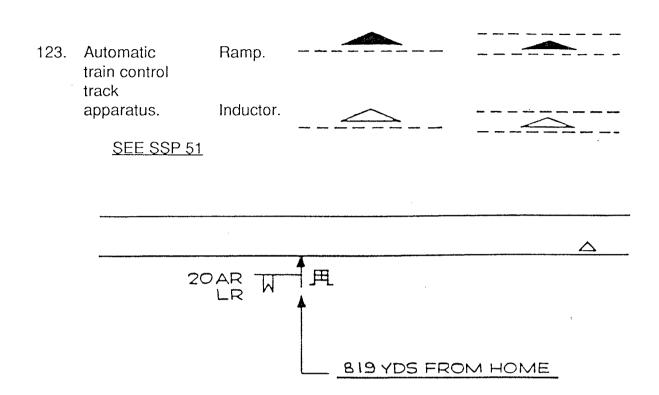
Contacts normally closed.



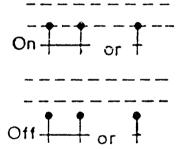
SEE SSP 51



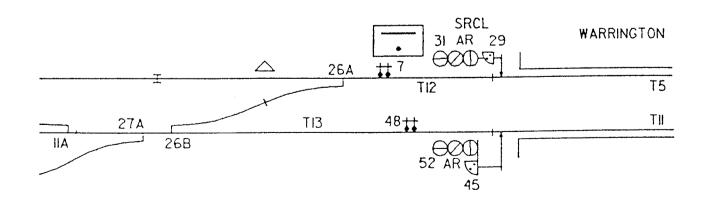
continued



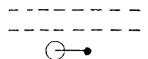
124. Detonator placer, emergency.



NOTE. Normal position to be indicated. If worked from signal-box add lever number.

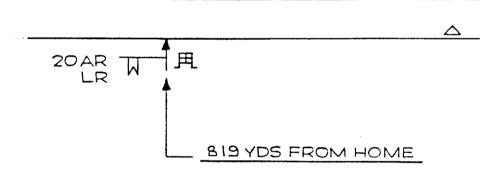


125. Detonator placer, magazine type.



126. Fogman's post.





127. Fogman's repeater.

Add M - Mechanically operated.

Add E - Electrically operated.

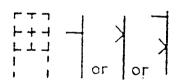
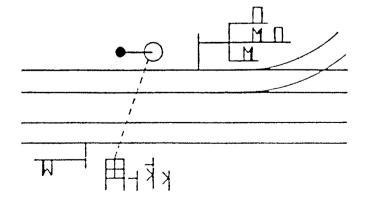
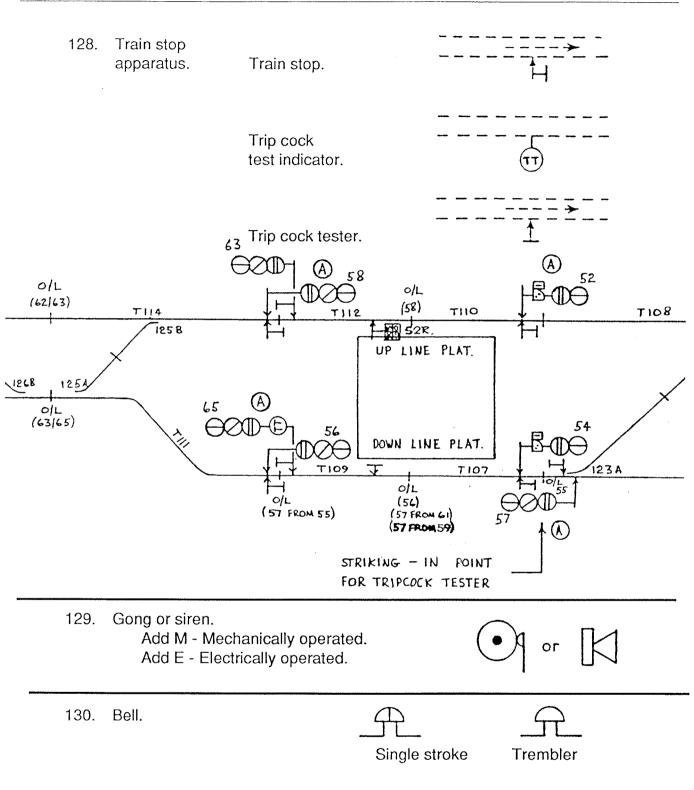
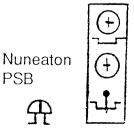


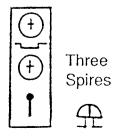
Diagram illustrating the use of the fogman's post and repeaters.







PSPT 3 Signal

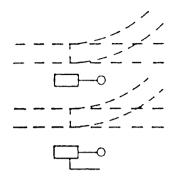


continued

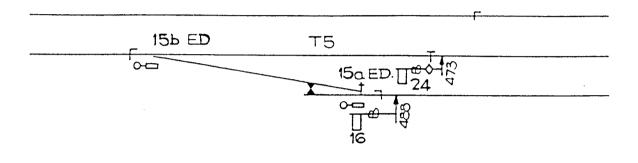
131. Point machine (power).

Point machine (dual control).

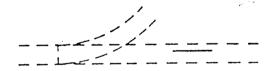
Type of machine may be distinguished by letters, eg. H/G for hand generator.



SEE SSP 51

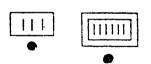


132. Clearance bar operated from signal box.



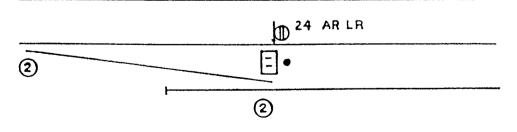
133. Ground frame

(Number of strokes indicate number of levers in frame.) 'Dot' indicates position of operator.



Uncovered

Covered



DOWN SIDINGS

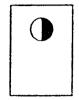
GROUND FRAME RELEASED BY LEVER 25

- 1 RELEASE LEVER
- 2 POINTS

137. Occupation key instrument.



138. Block instrument (permissive).

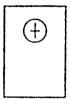




Non-peg

Peg

1.39. Block instrument (absolute non-controlled).

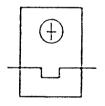


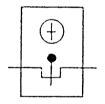


Non-peg

Peg

140. Block instrument (absolute controlled).

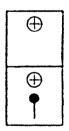




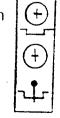
Non-peg

Peg

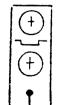
141. Combined block instrument.



Nuneaton PSB



PSPT 3 Signal



Three Spires





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INTRODUCTION TO PLAN SYMBOLS

Duplicate block instrument. 142.

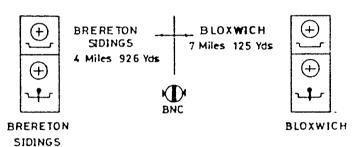
Where duplicate instruments are used repeat non-peg symbol.

143. Block switch.

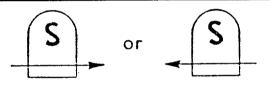


Plain

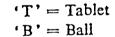


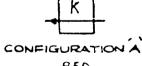


Token instrument. 144.



Add letters :- 'S' = Staff 'K' = Key token





RED

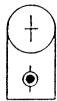


CONFIGURATION C GREEN

LLANDUDNO JCH

BLAENAU FFESTINIOG

145. Key release instrument.



Crank handle release instrument. 146.

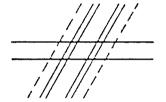


SECTION 6. LEVEL CROSSING

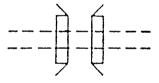
153. Road crossing.



154. Road crossing with tramway tracks.



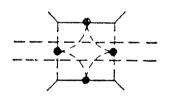
155. Cattle guard crossing.



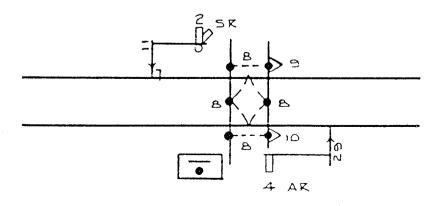
156. Sympathetic gates.

Interlocked and worked from signal box.

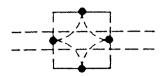
Add note if power operated.



(Full lines show normal position of gates.)

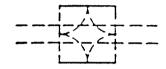


157. Sympathetic gates.
Interlocked and worked from ground.



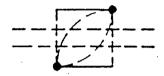
158. Sympathetic gates.

Worked by gateman and not interlocked.

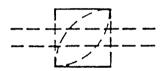


159. Non-sympathetic gates, interlocked.

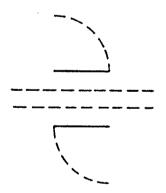
Add note if power-operated.



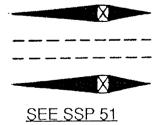
160. Non-sympathetic gates, not interlocked.

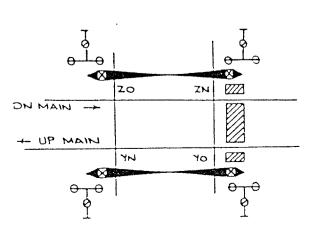


161. Non-sympathetic gates, occupation crossing.

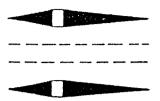


162. Lifting barriers, interlocked and worked from signal box.Add note if power-operated.



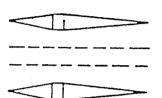


163. Lifting barriers, interlocked and worked from ground.



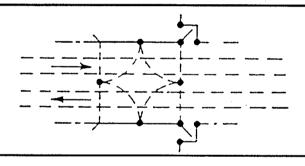
SEE SSP 51

164. Lifting barriers, non-interlocked and worked from ground.

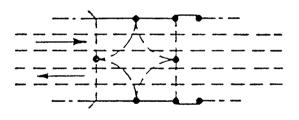


SEE SSP 51

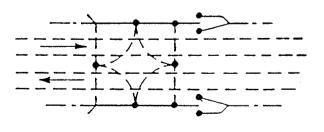
165. Level crossing with ordinary angle-pen wickets.



166. Level crossing with spring wickets.



167. Level crossing with cage gates.



168. Wicket gate locks (where provided).



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INTRODUCTION TO PLAN SYMBOLS

171. Level crossing block indicator.



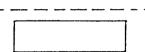


Double

Single

SECTION 7. BUILDINGS

176. Station platform.



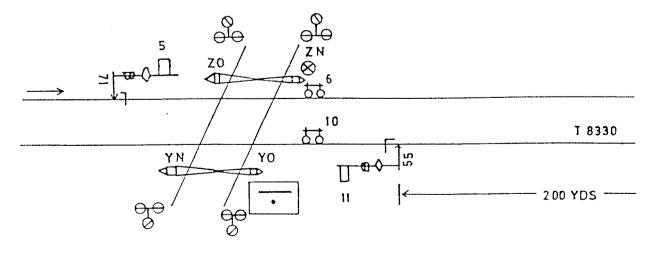
Length as required

177. Signal box, showing relative positions of operator and track.



Operator facing track

Operator with back to track



LOW HOUSE CROSSING SIGNAL BOX

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INTRODUCTION TO PLAN SYMBOLS

BRITISH RAILWAYS BOARD

STANDARD SIGNALLING PRINCIPLE NO. 51

Director of S & T Engineering

Ref. 206-66-68

Director of Operations

Ref. MM/S/3/51

SYMBOLS TO BE USED ON SIGNALLING PLANS AND SKETCHES

- 1. These symbols are supplementary to and, where applicable, supersede those shown in BS 376 Part 1.
- 2. The following general notes for plans, sketches etc. should be used as applicable:-
 - (a) Distances are given in yards, thus 1342 or in miles and yards, thus 38 + 1670 or in metric form, thus 25m, 100m

or 3.175 Km, 0.175 Km

If units other than miles and yards are used, then each dimension should be annotated accordingly on the plan.

- (b) All distances shown are to be checked by re-measurement on site.
- (c) Scale measurements are longitudinal.
- (d) The position and format of all new signals shown are subject to Sighting Committee reports.
- (e) All numbering is for reference purposes only.
- (f) Signal Post Replacement Switches are provided on all automatic and semi-automatic signals (switches not shown).
- (g) Telephones are provided at all colour light stop signals, all ground frames, and at other places as indicated below:-
 - Discrete Telephone (to signalman)
 - Other Telephones (associated with signalling or with safety of line)

2. (cont.)

- (h) All worked points are fitted with point heaters (Exceptions to be added as appropriate).
- (i) All worked points are operated by clamp lock (Exceptions to be added as appropriate).
- (j) Maximum speed of lines:-
- (k) Headway details:-
- 3. The symbols are shown on the following pages as listed below:-

Page 040

Signal Routes and Indications.

Page 041

Special symbols for signals and point operation.

Page 042

AWS, Warning Horn Signs, Special Loading/Unloading shunt signal and Position Light Signal (2 aspect).

Page 043

PSRs, Stop Board, line/turnout speeds, Reflectorised Distant Board, Mile Posts and miscellaneous signs and indicators.

Page 044

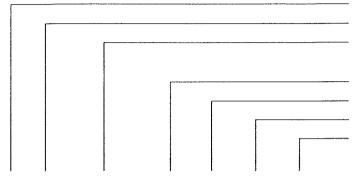
Plungers, Ground Panels, Treadles, HABD, track circuits and track overlaps.

Page 045

Level Crossings.

SIGNAL ROUTES AND INDICATIONS

Routes of Controlled Signals are shown thus:-



Signal Number Route Letter Destination

No. of Signal Ahead Class of Aspects Type of Route Indication Route indication displayed Special notes (if required)

				М	-	-	
	Α	MAIN	70	PL	ST	М	
68	В	BRANCH	170	М	JI	(4)	DY
				PL			
	С	SIDINGS	-	PL	ST	S	GF slot 3
	D	RELIEF	270	М	JI	(5)	

DY - Delayed clearance of main aspect from red to yellow when restricted overlap used beyond signal ahead.

AR - Main route approach released from red.

M - Main

PL - Position Light

JI - Junction Indicator

ML - Multi Lamp type indicator

ST - Stencil type indicator

AY - Main route approach released from yellow.

Preferred Route Indications

B - Branch Line

D - Down Line

F - Fast Line

G - Goods Line

M - Main Line

P - Passenger Line

S - Slow Line or Siding

SG - Siding (Where S used for slow Line)

U - Up Line

 X - To Limit of Shunt (qualified by additional indication if necessary)

1 - Platform 1

2 - Platform 2 etc.

Other symbols as appropriate

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DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Yellow aspect capable of flashing.		Signal supervised by main signal box but controlled from level crossing box only (alongside signal symbol).	\otimes
Facilities provided on panel for automatic operation.	A	Facilities provided on panel to over-ride Track Circuit Control (one movement only).	0
Signal not replaced until last vehicle has passed.		Facilities provided on panel for emergency replacement (alongside signal symbol).	E
		Note: Symbols (A) (L) (O) may be placed alongside signal symbol or in "special notes" column of route box.	(A)
Crank or pump handle provided for operating staff in case of failure.	H	Swing Nose Crossing.	
Points - ground frame operated (Identify by symbol or letter).	Z		
Clamp lock. (Use only when essential)	-0	Points fitted with switch heater (if exceptional - otherwise use general note if possible).	\otimes
Power point other than above (use only when essential).		Hydropneumatic self restored points (Train operated).	

TRAINING MANUAL INTRODUCTION TO RAILWAY SIGNALLING

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			T
DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
AWS - Unidirectional lines. Permanent magnet, Electro magnet provided if signal can show green aspect. 200 yds from signal.		AWS effective for both directions. Electro magnet provided for green aspects as required.	
As above, but with Selective Suppression according to route ahead eg at signals leading from unfitted to fitted lines.		Whenever an indicator is other than 200 yds from signal the distance to be shown eg 180 yds.	180
AWS - Bidirectional lines. Effective only for direction of traffic indicated by arrow. Suppressor implicit for other direction. Electro magnets provided		As above for an inductor associated with two signals. Dimension is to the signal towards which arrow points.	190 180
as required for green aspects.		AWS Termination of gap.	AWS
As above but with selective suppression for effective direction.	/ ►	AWS Commencement of gap.	AWS
		Commencement of special AWS working.	AWS
AWS Cancelling Indicator.		Termination of special AWS working.	AWS
	AWS	Transponder.	
Combined speed restriction/Warning horn sign (Speed as appropriate).	10 W	Special loading/ unloading shunt signal.	
Warning Horn Sign.	w)	Position light signal (2 aspect).	0 0

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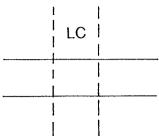
			· · · · · · · · · · · · · · · · · · ·
DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Advance Warning Sign for OC and AOCL.		Reflectorised Distant Board.	
Stop Board (Supplementary wording to be noted alongside).		Limit of restricted area for signal positions due to electric traction neutral section.	•
		'R' exhibited to indicate to the driver that the 'Ready to Start' signal has been given.	R
Speed Restriction sign for AOCL. Right and Wrong direction. Speed as appropriate.	X 25	Signal 'OFF' indicator.	OFF
Wrong direction speed Restriction sign for AHB, AOCR and MWL. (Speed as appropriate).	X 25	White light eg for shunter.	9
Permanent Speed Restriction Warning indicator (Speed(s) as appropriate).	50 <u>30</u>	Radio wavelength symbol (Number indicates channel).	3
Line Speed, local speed restrictions etc.	60 MPH 50 MPH	Mile post.	\Diamond
Turnout speed.	20 MPH	Kilometre post.	♦

TRAINING MANUAL INTRODUCTION TO RAILWAY SIGNALLING

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DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Plunger - 'Train Arrived'	• TA	Overlay Track Circuit.	
Plunger - 'Train Ready to Start' (indication to signal box)	• TRS	Track Circuit Eutectic Strip.	- V VVV
Plunger - 'Ready to Start' (Right Away) (Indication to driver)	• RA	Jointless track circuit centre feed.	
Plunger - 'Shunter's release'	SR	Extent of overlap 200 yds from signal.	
Ground Panel All electric type (Number denotes number of functions) (uncovered).	3	Extent of overlap if other than 200 yds eg if 180 yds.	18Ø
As above but covered.	3	Restricted overlap associated with delayed yellow aspect eg if 64 yds.	ROL 64 ———————————————————————————————————
Treadles - directional. Add arrow for operational direction eg	₽	Extent of overlap on lines used in both directions for running movements to indicate direction of traffic applying to overlap.	_
Hot Axle Box Detector.		Overlap on end of track circuited line T.C. on left, none on right.	

Level Crossings to be depicted thus:-



Type and mode of operation to be specified using the abbreviations as described in the Sectional Appendix.

Gates, where provided, to be shown in accordance with BS 376 Part 1. Lifting barriers, road traffic lights, drivers' flashing white lights, and other allied equipment to be shown in accordance with the symbols below. Specify the controlling/supervisory location.

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Lifting barriers, interlocked. Add note if not power operated. Applicable to manned, remote, CCTV		Lifting barriers, non interlocked and worked automatically. Applicable to automatic half barriers.	
monitored, and staff-operated barriers.	OR	Road traffic lights for level crossings.	0,0 L
		Driver's flashing white light for AOCL.	
Lifting barriers, non interlocked. Add note if not power operated. Applicable to	D	Level Crossing illumination light.	
Trainman-Operated Barriers, and Rural Barriers.	OR OI	Driver's flashing white light and crossing illumination light on same post.	
		Miniature warning lights.	(0)
		Barrow crossing white light.	O