

A small extract from Section 12 is given below to illustrate the format: this is Section X19 and some details for the whole line are presented first such as opening dates, whether single or double track, block working and milepost mileage, followed by details of each box along the route. Signal boxes controlling the junction are listed with the 'main line' regardless of their precise position in relation to the physical junction(s) and the milepost mileage quoted is that which relates to the line shown. A junction signal box may thus be shown with a milepost mileage of a few chains if it is sited a short distance along a branch line where the zero point for the branch line is the junction, whereas it would be shown with its 'main line' milepost mileage on the main line. Portcreek Junction is an example of this, its milepost mileage from Waterloo along SW073 being 91.02 whereas its milepost mileage from Brighton along LB 090 and SW 082 is 41.03. Hence it is shown in Sections J1 and X17 with a mileage of 41.03.

There is a horizontal line ruled between each signal box, with boxes normally listed in the down direction. This line is dotted where boxes are listed in the up direction. For each box a Railref reference is given (with a note of any converging or diverging lines controlled from that signalbox). Note that the 'end-on' junction at Cosham Station with SW 072 (see Section P4) where a change of ownership occurs is also shown in the same way. A separate line is used to show different generations of box (identified by a sequential number in the '#' column) and, within each generation, different frames. Where a box is rebuilt on the same (or similar) location it is given the next 'generation number' - if it is renamed, either during the previous generation or on rebuilding this is explained in the footnotes (and shown in the index).

The terms used under the column headings are explained below. The abbreviations 'nk' - not known, and 'wef' - with effect from, are used in various columns as necessary.

### X19: LBSCR/LSWR Joint: Cosham Station to Portcreek Junction

**Line:** opened 01.09.1848; **Track:** double; **Electrification:** 3rd rail DC wef 1990s

**Block Working:** introduced c1872 with Preece 1-wire 1872-07.1935 when SR 3-position until 1982 then TCB.

**Mileage:** from Waterloo (buffer stops) via Woking and Eastleigh

Ref	M	Name	#	Signal Box				Locking Frame			BS	Notes	
				Opened	Closed	Type	Construction/Size	Type	Gen's Size	Date			
SW 073-080	90.00	Cosham Station	1	u00.00.1872	00.08.1890	SW 3b	BTF	StSt Tap	4½"	22	1890	N	X97
			2 NW	00.08.1890	20.06.1982					25	1957		
»SW072		»Portchester, see Section P4											
SW 073-090	90.44	Cosham Junction	1	01.01.1860	00.00.1890	SX 1a	Wd	Sx 1856		1859			X98
			2	00.00.1890	05.05.1968	SW n/s		StSt Tap	4½"	14	1890	N	
»LB096		»Farlington Junction in Section J1, see Section Y23											

*excluding Portcreek Junction (see SW 082-010, Section X17) - milepost mileage 91.02*

### Section X notes

X97	(1): <b>Box:</b> on record but details nk (2): <b>Block:</b> Preece 3-wire <b>LC:</b> gates worked by wheel	X98	(1): <b>Levers:</b> different pitch sigs/points (2): <b>Block:</b> Preece 3-wire to Portcreek Junction; Tyers' to Farlington Jct
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### Column headed 'Ref'

Each signal box is given a unique three digit number which indicates its position, sequentially, along the route concerned. Each route has a five letter/digit code (Railref) with distance along the line of route being given by the milepost mileage. Boxes are listed in the Down direction, i.e. usually, but not always, going away from London. Junctions are indicated by » followed by the Railref line code for the converging or diverging line. The adjacent box on that line is given in the 'Name' column, along with the section number where details of boxes on that line are given. If no section number is given, then the branch is one with no intermediate boxes, often just a short chord linking two lines.

### Column headed 'M'

Milepost mileage: the distance in miles and chains (mm.cc) (there are 80 chains to the mile, each chain being 22 yards or 20.1 metres) from the 'zero point' location (usually identified in the section heading). For the main lines and more important branches this is the London terminus for the original operating company (viz. Charing Cross for SER; Victoria for LCDR, London Bridge for LBSCR; and Waterloo for LSWR). For minor branch lines and independent company lines where through trains from main line originating points were not normally scheduled, the distances are from the junction.

Distances have been included for all boxes open in 1920 for LBSCR and 1935 for SER/SECR, LCDR and LSWR, some others have been provided as reference points. Whilst the replacement box at some locations has been in a new position (e.g. Norbury box in south London was at the London end of the station in 1900 but at the country end when re-signalling took place in 1903) no earlier or later box should be more than about 10 chains difference from the mileage stated. Distances are not given for ground frames which are Non Block Posts.

### Column headed 'Name'

The name of the signal box is defined as that carried on the structure itself (excluding the words such as "cabin", "signal box" etc.). This may vary slightly from the title shown in working timetables, appendices or on the signal box diagram. Obviously photos are not to hand of all boxes, in which case the name commonly used is given herein. No distinction is made between 'Jct', 'Jcn' and 'Junction' nor between 'Sdg', 'Sdgs' and 'Siding'.

Where there have been two boxes at one station or location, but one of these closed/opened before or after the other, the suffix such as East is shown in brackets to indicate that during the period that the other box existed it carried this title, but was renamed on the opening or closing of the other box. This avoids footnotes in each such case. In some cases part of the box name appears in square brackets (for example Tunnel [Tadworth]) and the portion within the brackets [thus] never appeared on the nameplate but has been added to clarify matters where listed out of context, for example in the alphabetical index. Signal box names shown wholly in square brackets have been created purely for site identification purposes where the official name of a box remains unknown. Names wholly bracketed (thus) indicate locations where no box was provided, for example junctions in power signalling areas.

Inevitably some abbreviations have had to be used: Jct=Junction; Nth=North; Sth=South; Rd=Road; Shntg=Shunting; Cmn=Common; Ln=Lane; Dn=Down; Bdge=Bridge; Ctl=Central; LC=Level Crossing; Interm.=Intermediate; Gds=Goods; Pk=Park; GF=Ground Frame; BP=Block Post; NBP=Non Block Post.

### Column headed '#'

Where more than one box existed at a location (or nearby and bearing the same name), then the cardinal numbers are used to show the respective details. Where the box continued in use with a new frame, then the frame details are shown on separate lines. This column is also used to show the prefix letters for the box. This denotes the identification letters appearing on signals controlled from that box.

### Column headed 'Opened'

This is the date (or year) when the box was brought into use. Where a box was built in advance of commissioning, information appears in the 'Remarks' column. Where the opening date is not known, "od" denotes the date that the box was ordered; this is usually a few months before it was commissioned, though in some cases over a year elapsed.

"c." denotes approximate date.

"n" denotes the box was built but never commissioned.

"I" denotes date inspected.

"L" denotes the year "interlocking completed" in returns made to the Board of Trade.

"W" denotes date derived from working timetable or sectional appendix. Though generally reliable, boxes were sometimes in use over a year before they first appeared in such publications; similarly, some boxes continued to be listed even though they had been taken out of use. These dates are therefore not so reliable as the other sources.

### Column headed 'Closed'

Defined as the day on which a box became incapable of functioning as a block post; i.e. all arms and lamps removed or block switch/instruments disconnected. (Some boxes were permanently switched out of circuit prior to this date but were still capable of being manned if required.). In cases where the entire line closed, the closure date given may be that of the line, even though the box may have remained in situ until actually demolished some time later. In some cases the 'official' closure date was after the line closure, where the box may have been used in connection with track lifting or demolition.

"B" denotes box destroyed by bombing on date shown. "F" denotes box destroyed by fire on date shown.

"A" denotes box destroyed by accident on date shown.

**Column headed 'Signal box type'**

Boxes are described according to the classification developed by The Signalling Study Group (see 'The Signal Box – A Pictorial History and Guide to Designs'; 1986, Oxford Publishing Company), extended to include a small number of additional box types (for example SW4a, SW4b, SW5 and SW6). The nomenclature is explained in Section 9 although some general descriptions are given below.

Where a 'standard' type of box is insufficient or where information is sparse, then general abbreviations are used: B, Bk=Brick (and includes concrete); T, Wd=Wood; St=Stone; BTF=Brick to Operating Floor and wood above; STF=Stone to Operating Floor and wood above; O/d=overhead box usually on a metal bridge and invariably made of wood; N/S denotes non-standard design; GL denotes ground level; PL denotes platform level; BO denotes that the lever frame was located in the station booking office; E denotes that the box itself has been extended (to the new size shown), usually in connection with the installation of a new frame.

**Column headed 'Signal box Construction/size'**

Size is quoted in feet and inches, the first figure is the length, the second the width, and the third is the height of the operating floor above rail level (ARL). Ground level ('GL') boxes have an ARL of 0ft. Please note that whilst there are records for the dimensions of most LBSCR signal boxes but few have been traced for SER/SECR, LCDR or LSWR boxes. Length and width are measured externally unless otherwise stated - (i) indicates internal measurements. They may vary from those given on official documents.

**Column headed 'Locking frame type'**

The different types of frame are indicated by a code, explained in more detail in Section 8. This gives the name of the manufacturer and the type of frame. 'Conv' means locking converted or replaced by the type shown, with the existing lever frame retained. Further details about the mechanical frames can be found in The Signalling Study Group's 'A Guide to Mechanical Locking Frames', a revised edition of which is shortly to be published by the SRS. The two-letter abbreviations used in this section to identify the manufacturer are explained in Section 8. Where two names appear, e.g. StRS, this indicates that the frame is of a Stevens design but has been manufactured by the Railway Signal Company. For some frames, the manufacturer's official number is known and this is shown immediately below. Where a date (or other suffix) appears after the manufacturer's name this differentiates it from an earlier or later patent/model, e.g. SF 1871 and SF 1874. As used throughout, 'U' or 'u' indicates that the information (type of frame) cannot be confirmed.

Almost every mechanical frame manufactured in the 20th Century and a significant proportion of those from the latter part of the 19th were tappet locked from the outset. In addition, a majority of those 19th Century frames which were non-tappet at manufacture were relocked with tappets at or around the turn of the 19th/20th Century. Tappet locking is thus not always identified specially.

The LBSC obtained frames from a range of manufacturers as well as designing two of their own. To further confuse the issue, several manufacturers made frames to the design of their competitors (either under licence or because the patent had lapsed) and the LBSC variously had manufacturers make frames to their requirement or have them make parts and then assemble them in the Cold Blow Signalling Works at New Cross. Most of the new mechanical frames required by the Southern Railway (and subsequently British Railways, Southern Region) were sourced from Westinghouse from about 1930 onwards.

**Column headed 'Locking frame Cen's'**

The distance between the centre of one lever and its neighbour in a frame is shown in inches. It should be noted that in the S&F Spindle ('Spin') frames there were groups of point levers then of signal levers and so forth. Point levers at that time had a different length of travel from signal levers.

**Column headed 'Locking frame Size'**

This shows the number of levers in the frame at the date of installation with any known, subsequent changes being entered in the next row down, along with the date of the change if known.

'Setting' and 'Russell' levers etc. are not included in the totals but are referred to in the notes as they do not affect the overall size of the frame. In certain cases where there is only a change to these and/or the number of 'push-pull' levers, the frame may be shown as '(altered)' rather than extended (E=) or shortened (S=). Where the number of working levers is shown rather than the frame size, then this is indicated by a 'W' suffix.

**Column headed 'Locking frame Date'**

The date that the frame was manufactured is entered (where known) or the date of the signal box's commissioning if not. Where a frame is '2h' (second hand), the date of its original manufacture is entered where this can be traced. "YES" means coincident with the opening of the box. "O" Date frame ordered from works. "T" Date frame tested, usually coincident with opening of box or installation of new frame. "E" Denotes frame extended to this size. "S" Denotes frame shortened to this size.

**Column headed 'BS'**

Y Denotes block switch (or switch lever) provided. N Denotes block switch not provided  
 P Denotes block switch added later (date shown if known) R Denotes block switch recovered at later date.  
 E Denotes block switch provided for 'emergency' use only.

**Column headed 'Notes'**

A numbered reference is given to a footnote. The footnotes are listed at the end of each section. Other abbreviations include:

	Date box reduced in status to ground frame.	Further details such as box diagram, dog chart, locking table etc. may be found at <a href="http://www.svrsg.org/diags/Diagrams.htm#list">http://www.svrsg.org/diags/Diagrams.htm#list</a> .
GF	In this case closure date is that when the post was finally abolished.	
U or u (In any column)	denotes information unconfirmed.	Z Denotes temporary box
NBP	Non block post.	BP Block post.

**8. Locking frame types**

There were many different manufacturers of locking frames - the diversity of design being a necessary commercial imperative so that patent rights were not infringed. A signalling paper has been produced by the SRS explaining the principles of tappet interlocking and other signalling papers describe the Great Western 3- and 5-bar tappet frames and the twist frames in some detail. A series of articles on Railway Interlocking Frames by O.S.Nock was published in *'The Model Engineer'* in 1946 and 1947. A printed edition of the Signalling Study Group's *'A Guide to Mechanical Locking Frames'* is to be published shortly by the SRS.

The different types of locking frame all fulfilled the same purpose - of locking the levers in the frame so that conflicting routes could not be set up, that signals could only be lowered once the correct route had been set up and the route could not be changed unless the signal lever had been restored to normal.

The table below provides a key to the standard abbreviations used under the heading 'locking frame type' to indicate the type of frame provided and the method of locking used. Mechanical and electrical locking frames are initially described by the company who designed the equipment and these prefixes are listed in the column headed 'Code' below. The designer may or may not be the manufacturer and so where four letters are shown, for example 'StWh', the frame was designed by the first named, i.e. Stevens, but manufactured, usually under licence, by the second, i.e. Westinghouse. In the case of Stevens' frames only, since these were produced over time by various manufacturers, the latter, if known, is shown in this way but those known to have been produced by Stevens themselves are shown as 'StSt' and where the manufacturer is not known, then it is shown simply as 'St'. A suffix gives other information, where known, to describe the particular type of frame. Sometimes a generic suffix is shown, e.g. 'GF' for ground frame or 'Spl' for a frame specially made up, and a list of these abbreviations can be found at the foot of the table below. Some frames were provided with a serial number by the manufacturer and where known these have been included, e.g. 'Fr 11232' and 'Fr L55'. In the electronic era, panels of various types have been and are superseding mechanical locking frames. Panels are prefixed 'P' and usually have a suffix in parenthesis indicating the mode of operation, e.g. P(NX) for 'Entrance-Exit' panel.

In a small number of cases, none of the standard abbreviations apply, for example where a frame has been made up from secondhand parts by a signalling works - in this case they will be listed under the railway company's name in parenthesis, e.g. '(LNER)' or 'BR(E)' to indicate a frame made up at Leyton. A few frame types are also listed in parenthesis where the information available (given in full) is insufficient for a positive identification of one of the standard abbreviations.

## 8. Locking frame types (cont'd)

The list of abbreviations below is intended to be comprehensive across the British Isles and not all terms listed will be used in this register. So that little used frame types may readily be found, examples of usage are given, italicised where the example is from the manufacturer shown but not the specific variant listed. Where no example is quoted, then there is no entry in this register of that frame type.

Code	Manufacturer	Suffix	Method of locking	Years of manufacture	Example of usage
An	Anderson		Lever	u1864 - 1970	—
Ba	Bailey		Lever	1874 - u1877	—
BP	British Pneumatic Signalling	LP	Low pressure pneumatic; pull-out handles/slides	1901 - nk	SW 050-010
BP		pf	Power frame	1912	—
Ch	Chambers	Stp	Stirrup; lever/stirrup	1860 - c.1861	<i>GW 220-220</i>
Ch		Lvr	Lever	c. 1861 - c. 1866	—
Dn	Dutton	Com	Combination; catch-handle plus lever; tappet	1899 - 1892	—
Dn		1889	1889 patent; lever handle, tappet	1889 - 1890	SE 041-070
Dn		1893	1893 patent; catch-handle, tappet	1892 - c.1914	KE 001-115
Dn		DirT	Direct tappet; lever (direct), tappet	c.1890 - c.1900	—
Ea	Easterbrook	1867	1867 patent; lever locking catch-handle	1867	—
Ea		1868	1868 patent; catch-handle	1868 - u1872	—
Ea		1872	1872 patent; lever	1872 - 1886	SW 231-065
ED	Evans O'Donnell		Tappet; catch-handle	1895 - 1922	SE 001-070
GC	Great Central Railway		Tappet; lever (direct)	1905 - 1927	—
GN	Great Northern Railway	Clu	Clutch; lever	c.1869 - c.1873	—
GN		EL	East Lincolnshire; lever (direct), tappet	c.1887 - c.1904	—
GN		Tap	Tappet; lever (direct)	c.1883 - c.1913	—
GN		Dup	Duplex; catch-handle, tappet (lever and catch-handle locked)	c.1909 - c.1927	—
GR	Gloucester Wagon Company		Lever	1876 - 1884	—
GS	General Railway Signal	pg	Power frame; electric, 'pistol-grip'	1932 - nk	—
GS		'C'	'C'	(?)	—
GS		D	Power frame; electric, levers and slides	1935 - nk	—
GW	Great Western Railway	3bar	three bar locking (HT or VT, see below)		GW 220-180
GW		DbTw	Double twist; lever	u1890 - 1906	GW 220-240
GW		HT3 5¼" HT3 4"	Horizontal tappet, three bar locking at either 5¼" or 4" spacing; lever (reduced)	1906 - c.1908 1908 - 1926	LB 012-040
GW		La	Lane; lever	u1865 - u1870	—
GW		SgTw	Single twist; lever	1870 - 1890	—
GW		Stud	Stud; lever	c.1892 - 1908	SW 153-070
GW		VT3	vertical tappet, 3 bar locking; lever (reduced)	1908 - 1926	LB 012-050
GW		VT5	Vertical tappet, 5 bar locking; lever (reduced)	c.1926 - 1966	SW 151-040
Gy		Greenly		Special design for RHDR	1927
IA	I'Anson	1867	Lever	c.1867 - c.1869	—
IA		1869	1869 patent; lever	1869 - c.1887	—
LB	London Brighton & South Coast Railway	1880	1880s pattern; lever (direct), tappet	c.1880 - 1896	LB 020-004
LB		1905	1905 pattern; lever (direct), tappet	1905 - 1928	LB 090-390
LB		lug	Lug locking	nk	LB 020-020
LB		Spl	Bosham pattern; lever (direct) tappet	1901 -1904	LB 081-030
LD	London Chatham & Dover Railway	Tap	Tappet; lever (direct)	c.1878 - c.1906	SE 101-100

## 8. Locking frame types (cont'd)

Code	Manufacturer	Suffix	Method of locking	Years of manufacture	Example of usage
LM	London Midland Region		Standard 1943 pattern; catch-handle	1948 - c.1970	—
LS	London Midland and Scottish Railway	1938	1938 pattern; catch-handle, tappet	1938	—
LS		DW	Double wire; catch-handle, tappet	1923 - 1940s	—
LS		Wig	Wigan pattern	1940	—
LY	Lancashire & Yorkshire Railway	Tap	Tappet; lever (direct)	1889 - c.1928	—
MK	McKenzie & Holland	16	Nos. 16, 17; lever (direct), tappet	1903 - 1924	—
MK		21	No. 21; lever (direct), tappet	1908 - c.1920	—
MK		1866	1866 patent; lever	1866 - 1873	—
MK		1873	1873 patent; lever (also known as cam and soldier)	1873 - c.1888	—
MK		1886	1886 patent; lever	1886 - 1890s	—
MK		CT	Cam & tappet; lever (reduced), tappet	c.1893 - 1924	—
MK		em	Electro-machanical	c.1930 - nk	EL 001-070
MK		Tap	No. 17A; lever (direct), tappet	1940 - 1961	SE 021-060
MS		Manchester Sheffield & Lincolnshire	IB	Iron brackets; lever (direct)	c.1873 - c.1886
MS	Tap		Tappet; lever (direct)	c.1890s	—
MT	Metropolitan Railway	Tap	Tappet; lever (direct)	u1889 - u1896	—
MR	Midland Railway	1865	1865 pattern; not known	c.1870	—
MR		LAT	Lever action tumbler	u1870s - 1880s	—
MR		SW	Single wire; lever	1870s - 1901s	—
MR		Tap	Tappet; catch-handle	1909 - 1922	—
MR		Tum	Tumbler; catch-handle	u1869 - 1907	—
MR		WR	Tumbler (works relock); catch-handle, tappet	1906 - 1909	—
NE	North Eastern Railway		(actuation, not known)	c.1870	—
NL	North London Railway		Tappet; lever (direct)	1890 - 1909	—
NW	London & North Western Railway	1874	1874 patent; catch-handle	1874 - 1875	—
NW		cam	Cam Head; catch-handle	1875 - 1876	—
NW		Tap	Tappet; catch-handle	1903 - c.1930	—
NW		Tum	Tumbler; lever (indirect)	1876 - 1906	GW 030-010
Ra	Rapier	1870	1870 patent; lever	1871 - 1880	—
RE	Railway Executive Committee		Tappet; catch-handle	1923 - 1948	—
RS	Railway Signal Company	1877	1877 patent; lever	1881 - c.1884	—
RS		GN	Great Northern of Ireland; lever (direct), tappet	1930s - c.1964	—
RS		HT	HT	(?)	—
RS		LNE	LNER Standard; lever (direct), tappet	c.1928 - c.1945	—
RS		Pf	Power frame; electrical locking	1903 - nk	—
RS		Tap	Tappet; lever (direct) tappet	1884 - 1920s	SE 028-060
SC	South Eastern & Chatham Rly		New pattern; lever (reduced), tappet	1907 - 1928	SE 090-050
SE	SER/ SECR	cam	cam (also known as Brady cam)	1867 - c.1890	SE 041-130
SE		Tap	SER/SECR; lever (direct), tappet	c.1890 - c.1906	SE 001-380

## 8. Locking frame types (cont'd)

Code	Manufacturer	Suffix	Method of locking	Years of manufacture	Example of usage
SF	Saxby & Farmer	1867 W	July 1867 patent (wedge); catch-handle	1867 - c.1869	LB 001-060
SF		1867 B	July 1867 patent (bell cranks); catch-handle	u1867 - 1871	—
SF		1871	1871 patent rocker; catch-handle	1871 - 1874	LB 040-150
SF		1874	1874 patent rocker & grid iron; catch-handle	1874 - 1888	LB 004-040
SF		1888	1888 Duplex; catch-handle (lever & catch-handle locked)	1888 - 1905	SE 045-010
SF		1905	1905 Duplex; catch-handle (lever & catch-handle locked)	1905 - u1914	—
SF		1914	1914 'A'; catch-handle	1914 - 1924	—
SF		Duplex	Duplex (see 1888, 1905 above)	(?)	—
SG	Siemens/ General Electric	pf	Power Frame; electric, miniature levers	c.1930 - nk	SE 101-010
SG		rs	Power Frame; electric, route setting panels	c. 1960 - nk	—
Si	Siemens	power	Electric; levers acting as electric switches	c.1900 - nk	GW 089-100
Si		CT, VT	CT, VT	(?)	—
Sm	Smith		Treadle	1870 - 1882	—
St	Stevens	Cal	Caledonian; lever (direct), tappet	c.1897 - c.1964	—
St		GNP	Glasgow New pattern/GSW; lever (direct), tappet	c.1895 - c.1923	—
St		GOP	Glasgow Old Pattern; lever (direct), tappet	c.1868 - 1900s	—
St		Hk	Hook; lever	1860 - 1870	SW 001-010
St		Knee	Knee; lever (direct), tappet	u1880s - 1960s	SW 140-160
St		MK	Stevens (McKH Cam & Tappet); lever (reduced)	u1890s - 1910s	—
St		MK28	Stevens (McKH 28); lever (direct), tappet	1910s	—
St		Stp	Stirrup; stirrup	1843 - 1860	LB 040-060
St		Tap	Tappet; lever (direct), tappet	c.1870 - c.1928	SW 140-100
SX	Saxby	1856	1856 patent; lever (no locking)	1856 - 1860	LB 004-080
SX		1860	1860 patent; lever	1860 - 1867	LB 001-180
Sy	Sykes & Company	em	Electro-mechanical	c.1900 - nk	SE 001-210
Tw	Tweedy	1873	1873 patent; lever	u1873 - u1890	—
Tw		Tap	Tappet; lever (direct)	u1890 - u1905	—
Ty	Tyer & Company	DirT	Direct tappet	u1909 - u1930	—
Ty		Knee	Knee; lever (direct), tappet	c.1890s - c.1940s	LB 080-240
WT	Webb & Thompson		Power frame; electric	from 1898	—
Wh	Westinghouse	17A	17A; lever (direct), tappet	1940 - 1961	—
Wh		A	Electro-pneumatic	1902 - 1903	—
Wh		A2	A2; catch-handle	1924 - 1949	LB 094-020
Wh		A3	A3; catch-handle	1949 - 1977	SE 020-180
Wh		B	Electro-pneumatic, miniature lever power frame	1903 - 1920s	EL 001-090
Wh		DW	Double wire; catch-handle, tappet	1923 - 1940s	—
Wh		GB	Electro-pneumatic; ground frames	1907	—
Wh		K	Miniature lever power frame with mechanical interlocking	1923 - 1928	SE 001-010
Wh		L	Miniature lever power frame; electric, all-electric interlocking	1929 - 1961	LB 040-120
Wh		N	Electro-mechanical, miniature lever power frame; for LPTB	1931 - 1948	—
Wh		O	Power frame; electric, for use in collieries	1952 - 1955	—
Wh		pf	Power frame; electric	from 1898	—
Wh		US	Electro-pneumatic; Granary Junction, GER	1899	—

**8. Locking frame types (cont'd)**

Panels, switches and Automatic Route setting equipment (all electric)

Code	Type of panel	Years of manufacture	Example of usage
P(CBI)	Siemens 'SIMIS-W' computer-based interlocking	2000s-	—
P(HW)	Henry Williams Integra Domino 'Entrance-Exit' panel	1960s-	—
P(IFS)	Individual Function Switch(es)	1950s-	SE 071-026
P(INT)	Integra panel	1960-	—
P(MFS)	Multiple function switch panel	1980s-	—
P(NX)	Entrance-Exit panel	1930s-	LB 020-110
P(OCS)	One Control Switch panel	1950s-	SE 001-340
P(PB)	Push Button; various types, mainly shunting yards	1920s-	SW 030-210
P(RETB)	RETB; uses radio transmission with VDUs	1980s-	—
P(SGNX)	Siemens/General Electric 'Entrance-Exit' panel	1960s-	—
P(sw)	Swiss Integra Domino 'Entrance-Exit' panel	1980s-	—
P(TBS)	Transmission based signalling (no lineside signals)	2000s-	—
P(VDU)	Visual Display Units	1990s-	LB 090-400
P(WM3)	Westinghouse M3 'Entrance-Exit' panel	1990s-	—
P(WNX)	Westinghouse 'Entrance-Exit' panel	1950s-	—
P(WOCS)	Westinghouse One Control Switch panel	1930s-	—
P(WVDU)	Westinghouse 'Westcad' VDU	2000s-	—
panel	Unspecified panel (see above)	(?)	SW 012-020
Other abbreviations			
Abbrev.	Meaning	Abbrev.	Meaning
2h	second-hand	GF	ground frame
E=nn	Frame extended, number of levers and date is also given in their respective columns where known	S=nn	Frame reduced or shortened, number of levers and date is also given in their respective columns where known
Spl	Frame specially made up for a particular location		

Note - not all variants of a manufacturer's design are listed as separate standard abbreviations. The McKenzie and Holland 1873 patent had six variants, namely nos. 4, 5, 5A, 6, 6A and 8; the 1886 patent had three variants namely nos. 9, 11 and 12 and their cam and tappet design had variants nos. 13 (4" centres) and 14 (5" centres). Such additional information as this is included, where known, in brackets after the standard abbreviation.