

Railway signalling symbols —

Part 2: Wiring symbols and written circuits

Confirmed
June 2010

Co-operating organizations

The Electrical Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:—

- Admiralty
- Air Ministry
- Association of Consulting Engineers (Incorporated)
- Association of Supervising Electrical Engineers
- British Electrical and Allied Industries Research Association
- British Electrical and Allied Manufacturers' Association
- British Electrical Development Association
- British Electricity Authority and Area Boards
- British Railways, The British Transport Commission*
- Cable Makers' Association
- Crown Agents for the Colonies
- Electric Lamp Manufacturers' Association
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- Electrical Contractors' Association (Incorporated)
- Electrical Contractors' Association of Scotland
- Engineering Equipment Users' Association
- General Post Office
- Institution of Electrical Engineers*
- Ministry of Fuel and Power
- Ministry of Labour and National Service (Factory Department)
- Ministry of Supply
- Ministry of Works
- National Physical Laboratory
- North of Scotland Hydro-Electric Board
- Oil Companies Materials Committee
- Public Transport Association (Incorporated)
- Radio Industry Council
- War Office

The Government department and scientific organization marked with an asterisk in the above list, together with the following, were directly represented on the Committee entrusted with the preparation of this British Standard:

- London Transport Executive
- Ministry of Transport
- Manufacturers of railway signalling apparatus

Amendments issued since publication

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Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
Notes and recommendations on the nomenclature for wiring diagrams, written circuits and the labelling of wires	1
Written circuits	1
Meaning of letters	2
Examples of common combinations	3
Nomenclature for electrical supply	5
Labelling of wires	6
Arrangement of symbols	10
Symbols	10
Examples of wiring circuits and written circuits	56
Alphabetical index to symbols	67
Figure 1	6
Figure 2	7
Figure 3	7
Figure 4	7
Figure 5	7
Figure 6	8
Figure 7 — Layout and track circuit plan	56
Figure 8 — DR circuit	57
Figure 9 — Point and track indications	58
Figure 10 — Signal and junction indicator lighting	59
Figure 11 — Signal controls	60
Figure 12 — Lock circuits	61
Figure 13 — Location A101, using wiring diagram symbols	62
Figure 14 — Location A101, Alternative method using written circuit symbols	63
Figure 15 — Signal and light indicator	64
Figure 16 — Block indicator and bell	64
Figure 17 — Track circuits controlling signals	64
Figure 18 — Examples of wiring labels	65
Figure 19 — Examples of use of suffix symbols on repeating relay circuits	66

Foreword

This standard makes reference to the following British Standards:

BS 108, *Graphical symbols for general electrical purposes*.

BS 204, *Glossary of terms used in telecommunication*.

BS 530, *Graphical symbols for telecommunication*.

Part 1 of BS 376 shows schematic symbols designed for use on railway layout plans to show the signalling requirements.

The present publication, "*Wiring symbols and written circuits*", forms Part 2 of BS 376 and completes the revision of this British Standard.

Part 2 shows railway signalling symbols for wiring diagrams and written circuits, and also explains a system of labelling wires in such a manner that each wire can be readily identified with that shown on the circuit diagram.

The symbols also include a few installation symbols for use on plans required to indicate the approximate positions of the apparatus or wiring concerned.

The wiring symbols have been prepared to provide for apparatus in general use, and have been so designed that they may be combined with each other where one does not adequately represent the complete device.

In the written circuits, such combination is unnecessary as several portions of one piece of apparatus may be shown in entirely different positions on the diagram.

Wiring circuits of various types are used but these can generally be divided into those now known as wiring diagrams and written circuits.

A wiring diagram is, generally, one in which each complete piece of apparatus is represented by a symbol. For instance, a direct current relay comprises a coil and at least one moving contact. (See Section 12). The wiring diagram would show wires connected to the coils of the relay and other wires to the contacts which are controlled by the coil.

A written circuit is an abridged and simplified circuit diagram in which the symbols, with abbreviated designations, are drawn in a straight line, the two ends of which represent the terminals of the source of supply.

The two types of circuits are illustrated in juxtaposition in Figure 15, Figure 16 and Figure 17, so that the difference may be readily appreciated.

Figure 8 to Figure 12 give examples, in written circuit form, which purport to show the complete wiring for the signalling installation shown in Figure 7 with the minor exception that simple circuits are not repeated over and over again with different numbers, as they might be in a complete set of circuits.

Figure 13 and Figure 14 give alternative methods of showing the wiring of one of the signal locations of Figure 7.

Nomenclature is used chiefly in connection with written circuits and the labelling of wires; but it may also be used with advantage to a lesser extent in wiring diagrams.

In the following pages are shown the symbols. In each instance those suitable for the wiring diagram and for the written circuit are printed side by side. Further, in order to make clear the matter of nomenclature for the circuits, as well as the labelling for wires run in accordance with the circuits, there is shown opposite each symbol the recommended nomenclature.

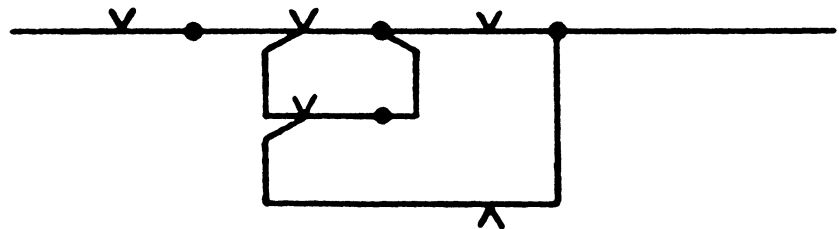
In certain instances neither the symbol nor the nomenclature can fully convey all the information required. In these cases the sign  is used to indicate that reference to the notes on the plan is necessary (see Symbol 1821).

The curve  indicates alternating current. Unless otherwise indicated direct current to be assumed.

e.g., Electro-Magnet A.C.  Bell. A.C. 

In a written circuit, where polarity is not indicated, the left, or upper, termination of the line is considered to be positive, or feed of supply.

In drafting written circuits it is important that there shall be no doubt as to which terminal of a piece of apparatus a wire is connected. The method of ensuring this is shown below:



The symbols given in this standard are for railway signalling systems. They are not intended to be used for power supply diagrams, commercial electrical engineering machinery, or telecommunications. For these systems, reference should be made to BS 108, "*Graphical symbols for general electrical purposes*", BS 204, "*Glossary of terms used in telecommunication*", and its supplements, and to BS 530, "*Graphical symbols for telecommunication*".

If a symbol required for railway signalling purposes does not appear in this standard, the symbol should be taken from the appropriate British Standard.

When necessary, to avoid confusion, diagrams may be marked with the following reference:

Symbols to BS 376-2:1954

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 68 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Notes and recommendations on the nomenclature for wiring diagrams, written circuits and the labelling of wires

Written Circuits and Wiring Diagrams

In order to provide a concise, suggestive, graphic code for marking the units on plans, the following system has been evolved which makes use of a designation made up of two parts, namely:—

- 1) *Numerical prefix*. The number of the principal lever, signal, track circuit, etc., entering into the control of, or controlled by, the unit.
- 2) *Alphabetical term*. Consisting of one or more letters. When the letter is used singly or finally it is used as a noun and designates the general kind of unit. Preceding letters, which are used as adjectives, denote the purpose of the unit.

Where reference is to be made to the position of levers, switches, push buttons or any other device operated by the signalman, as in the case of a lever lock or a relay representing a lever position, the letters which appear in symbols 1601, 1602 and 1603 shall be used in brackets immediately before the final letter.

The complete designation of a unit is written as follows:—

10HR (without dots or dashes)		
(Numerical prefix)	(Prefix letter)	(Final letter)
10	H	R

In the example, “10” is the number of the signal, but when used to refer to the signal will be “10G”. When the figure is used alone, it will be understood to refer to the lever, thumb switch, push button or other equipment actuated by the signalman for the control of the signal thus “10(N)R” indicates a relay repeating the normal position of the lever, thumb switch, etc. To avoid confusion, there should be no duplication of numbers for thumb switches, levers, etc.

“10R” indicates a relay associated with Signal 10 and “10HR” indicates a relay controlling the caution (yellow) aspect of Signal No. 10. and “10HR” indicates relay controlling the caution (yellow) aspect of Signal No. 10. In other words, the letter “R” means relay in general; the letter “H” indicates that the function of this relay is to control the caution (yellow) aspect; and the number “10” definitely indicates the signal which this “caution” relay controls.

Indices are used to denote:

- 1) A specific terminal (see Pages 8 and 9).
- 2) A specific signal where more than one is operated by one lever (see Pages 3 and 4).
- 3) A specific relay where more than one is connected in parallel on account of insufficiency of contacts on one relay (see Page 5).

In terms where the last letter is not a capital letter, the final capital letter in the designation shall still be read as a “noun” letter.

Example 14KRf^{A1}

Explanation No. 1 terminal of fuse A of No. 14 indicating relay.

As far as practicable assigned letters are suggested, either because they are the first letter in the words they represent, for example: B, Block; or because of usage: D, Clear; H, Caution. But many letters stand for names which cannot be associated and are arbitrary symbols only, as J, Rectifier; U, train description apparatus. Some of the letters represent several different meanings or words, depending on their position with respect to numerals and other letters; if the scheme is used consistently there should be no mistake in meaning.

To provide for exceptional cases where the symbols do not cover the whole of the conditions, a detailed description may be placed in brackets after the symbols. For example a relay repeating a lever normal, a point indicating relay and a number of track circuits, may be as shown below, and in such a case, the relay should preferably be given a distinctive individual number. A convenient way would be to start the numbers for such relays at 1000, which would avoid confusion with any other numbers.

1010 PR[10(N), 10WKR, ATR, BTPR, CTR, DTP²R]

Due to the use of distinctive number, it will only be necessary to use the designation "1010 PR" for the label of the relay or the labelling of wires, but it is recommended that the full description be shown at least once on each sheet of drawings, so that it is available for ready reference and indicates the complete control for the appropriate relay. It would be convenient for these complete details to be shown in one corner of the diagram, if they are not shown as complete symbols in the body of the diagram itself.

In the case of an item where there is no actual designation, a descriptive word may be included in the brackets, as:

10R (Overload)

Meaning of letters

<i>Description term (Prefix letter)</i>		<i>Apparatus (Last letter)</i>	
A.	Approach; Automatic	A.	Block instrument.
B.	Block; Bolt.	B.	Contact.
C.	Checking or proving; Coding.	C.	Electric lamp (illuminating); Earth.
D.	Clear (green); Decoding.	D.	Fogging apparatus (e.g. detonator placer).
E.	Light; Heat (externally applied); Emergency; Earth.	E.	Fuse.
F.	Fog.	F.	Signal apparatus, including Light sights.
G.	Signal.	g.	Lightning arrester.
H.	Caution (yellow).	H.	Capacitor.
HH.	Preliminary caution (double yellow)		
I.		I.	Inductor.
J.	Time (delayed action).	J.	Rectifier.
K.	Indicating or detecting.	K.	Indicator (visual).
L.	Locking; Left.	L.	Lock.
M.	Marker; Magnetic.	M.	Motor.
N.	Normal.	N.	Release; Hand-operated switch; Push button or key.
O.	Retarder.	O.	Resistor.
P.	Repeating.	P.	Lever latch or trigger contact.
Q.	Treadle or bar.	Q.	Local coil of double-element relay.
R.	Reverse; Right; Danger (red).	R.	Relay or contactor (line or track element of double-element relay).
S.	Stick.	S.	
T.	Track circuit.	T.	Transformer; Transmitter.
		t.	Terminal.

U.	Route (aspect displayed to be shown in brackets. See examples pp. 3 and 4).	U.	Train description apparatus (for route indicating).
V.	Trainstop.	V.	Trainstop apparatus.
W.	Points.	W.	Points operating apparatus.
X.	Audible indicator (such as bell, buzzer, horn) Level or Highway Crossing.	X.	Audible indicator (such as bell, buzzer, horn).
Y.	Slotting or disengaging.	Y.	Disengaging apparatus.
Z.	Special (to be explained on plan).	Z.	Special unit (to be explained on plan).
Up.	Up (direction of traffic).		
Dn.	Down (direction of traffic).		

Examples of common combinations

NOTE Any letter or number used as an index to a numeral indicates an individual track, signal, etc. (see Example 10^AG). In the case of three-position levers with centre position as normal, push and pull are indicated by the index letters "F" and "T" (see Example 10^FA G).

B.		
	DnB	Block instrument, down (direction of traffic).
E.		
	10GE	Electric lamp illuminating all aspects of Signal No. 10.
	10DE	Electric lamp illuminating clear aspect of Signal No. 10.
	10ME	Electric lamp illuminating marker light of Signal No. 10.
	10 ⁽⁶⁾ UE	Electric lamp illuminating No. 6 indication of route indicator working in connection with Signal No. 10.
F.		
	10F	Fogging apparatus operated in connection with Signal No. 10 or Lever No. 10.
G.		
	10G	Apparatus for operating Signal No. 10.
	10DG	Apparatus for operating clear aspect of Signal No. 10.
	10HHG	Apparatus for operating preliminary caution aspect of Signal No. 10.
	10HG	Apparatus for operating caution aspect of Signal No. 10.
	10RG	Apparatus for operating danger aspect of Signal No. 10.
	10PG	Signal repeating Signal No. 10.
	10FPG	Signal repeating, for fog purpose, Signal No. 10.
	10 ⁽⁶⁾ UG	Route signal apparatus working in conjunction with Signal No. 10, displaying the indication "6".
	10 ^(Sdg) UG	Route signal apparatus working in conjunction with Signal No. 10, displaying the indication for siding.
	10 ^F G	Apparatus for operating signal controlled by push position of Lever No. 10.
	10 ^T G	Apparatus for operating signal controlled by pull position of Lever No. 10.
	10 ^A G	Apparatus for operating Signal A controlled by Lever No. 10.
	10 ^F A G	Apparatus for operating Signal A controlled by push position of Lever No. 10.

K.

10EK	Indicator (visual) for light on Signal No. 10.
10G/EK	Indicator (visual) for aspect and light on Signal No. 10.
10FK	Indicator (visual) for Signal No. 10 for fogman's use.
10GK	Indicator (visual) showing aspect of Signal No. 10.
10DGK	Indicator (visual) showing clear aspect of Signal No. 10.
10HHGK	Indicator (visual) showing preliminary caution aspect of Signal No. 10.
10HGK	Indicator (visual) showing caution aspect of Signal No. 10.
10RGK	Indicator (visual) showing danger aspect of Signal No. 10.
10LK	Indicator (visual) for lock on Lever No. 10.
10TK	Indicator (visual) for Track Circuit No. 10.
10NWK	Indicator (visual) showing normal position of Points No. 10.
10YK	Indicator (visual) in connection with slot on Lever No. 10.

NOTE Where the indicator is of the lamp type, add the letter "E",
e.g.,

10DGKE.

^aL.

10(B)L	Lock effective in normal indication position of Lever No. 10.
10(FK)L	Lock effective in push indication position of Lever No. 10.
10(N)L	Lock effective in normal position of Lever No. 10.
10(M)L	Lock effective in mid position of push-pull Lever No. 10.
10(R)L	Lock effective in reverse position of Lever No. 10.
10(T)L	Lock effective in pull position of Lever No. 10.
10(F)L	Lock effective in push position of Lever No. 10.
10(NB)L	Lock effective in normal, also in normal indication, position of Lever No. 10.
10(RD)L	Lock effective in reverse, also in reverse indication, position of Lever No. 10.
10(NBDR)L	Lock effective in normal, normal indication, and in reverse indication and reverse positions of Lever No. 10.

Q.

10TQ	Local winding on track relay No. 10.
------	--------------------------------------

R.

^b 10GAR	Relay for approach control to Signal No. 10.
10DECR	Relay checking or proving the light for the clear aspect of Signal No. 10.
10VCR	Relay checking or proving the position of Trainstop No. 10.
10DR	Relay controlling the clear aspect of Signal No. 10.
10HR	Relay controlling the caution aspect of Signal No. 10.

^a Letters in bracket in this section refer to lever position (see Symbols 1601 and 1602).

^b As the lever will generally be used for one piece of apparatus only, the first letter may be omitted if desired.

10HHR	Relay controlling the preliminary caution aspect of Signal No. 10.
10JR	Relay time or delayed action in connection with Lever No. 10.
^a 10WKR	Relay for indicating or detecting position of points worked by Lever No. 10.
^a 10WKPR	Relay repeating the indication relay of Points No. 10.
10TPR	Relay repeating the relay of track circuit No. 10.
NOTE Where more than one track repeating relay is used, controlled direct from the track relay, these may be indicated by adding a numerical index to the letter P, e.g. :— 10TP ¹ R, 10TP ² R, etc. Where relays are connected in cascade, the second or subsequent relays may be indicated by using additional P's, e.g. :— 10TPR, 10TPPR, etc.	
10RR	Relay controlling the danger aspect of Signal No. 10.
10SR	Stick relay working in conjunction with Lever No. 10, self-maintained until current is interrupted.
10TR	Relay of Track Circuit No. 10.
10WR	Relay or contactor controlling Points No. 10.
10YR	Relay controlled by slotting or disengaging Lever No. 10.
U.	
DnU	Train description apparatus, for down traffic.
V.	
10V	Trainstop apparatus associated with Signal No. 10.
W.	
10NW	Apparatus for operating Points No. 10 to the normal position.
10RW	Apparatus for operating Points No. 10 to the reverse position.
Y.	
10GY	Disengaging apparatus associated with Signal No. 10.
NOTE The number may be prefixed by letters indicating the signal box in which this lever is located, e.g., HS10YR = High Street, etc.	

^a As the lever will generally be used for one piece of apparatus only, the first letter may be omitted if desired.

Nomenclature for electrical supply

Particular of the supply for any circuit may be indicated by nomenclature at the ends of the circuit diagram. The voltage of the supply can be indicated by numerals in the nomenclature. Where polyphase systems are used, symbols indicating the particular phase will follow the numeral: the use of the letters R, Y, B and G, is recommended. (See Figure 4).

The following nomenclature has been evolved, and diagrams illustrating its use are given on Pages 6, 7 and 8, and also on Figure 8 to Figure 18.

B (or +)	Indicates connection by an individual wire to the busbar or supply terminal of a direct current system (positive side). (See Figure 1).
N (or –)	Indicates connection by an individual wire to the busbar or supply terminal of a direct current system (negative side). (See Figure 1).
BN	Indicates connection by an individual wire to the busbar or supply terminal of a direct current system at an intermediate point. (See Figure 2).

BX	Indicates connection by an individual wire to the busbar or supply terminal of an alternating current system (feed side). (See Figure 3 and Figure 4).
NX	Indicates connection by an individual wire to the busbar or supply terminal of an alternating current system (return side). (See Figure 3 and Figure 4).
BNX	Indicates connection by an individual wire to the busbar or supply terminal of an alternating current system at an intermediate point of a single-phase system. (See Figure 3).
CB	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of a direct current system (positive side). This wire forms an extension of B. (See Figure 5).
CN	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of a direct current system (negative side). This wire forms an extension of N. (see Figure 5).
CBN	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of a direct current system at an intermediate point. This wire forms an extension of BN in a similar manner to CB and CN.
CBX	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of an alternating current system (feed side). This wire forms an extension of BX. (see Figure 6).
CNX	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of an alternating current system (return side). This wire forms an extension of NX. (See Figure 6).
CBNX	Indicates connection to a wire common to other circuits which is connected to the busbar or supply terminal of an alternating current system at an intermediate point. This wire forms an extension of BNX in a similar manner to CBX and CNX.
CR	Indicates connection to a wire common to other circuits with separate sources of energy and insulated from earth. (See Figure 16).
CRE	Indicates connection to a wire common to other circuits with separate sources of energy and connected to earth.
R	Indicates connection to a wire which is an individual return to the source of energy.
TB	Indicates supply connection to track circuit rail (positive or feed side). (See Figure 7, Figure 13 and Figure 14).
TN	Indicates supply connection to track circuit rail (negative or return side). (See Figure 7, Figure 13 and Figure 14).
RB	Indicates track circuit relay connection to rail (positive or feed side). (See Figure 7, Figure 13 and Figure 14).
RN	Indicates track circuit relay connection to rail (negative or return side). (See Figure 7, Figure 13 and Figure 14).

Examples of nomenclature for electrical supply

NOTE Illustration of battery or transformer forms no part of the symbol.

B10 (or + 10)	Indicate connection to the 10 V. positive busbar or terminal of a D.C. system.
N10 (or – 10)	Indicates connection to the 10 V. negative busbar or terminal of a D.C. system.

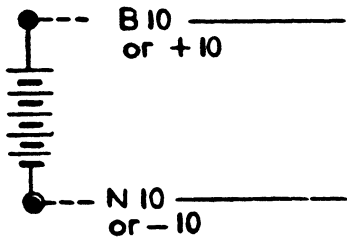


Figure 1

N10BN
or
B10BN

Indicates connection to the 10 V.
intermediate terminal or busbar
of a D.C. system.

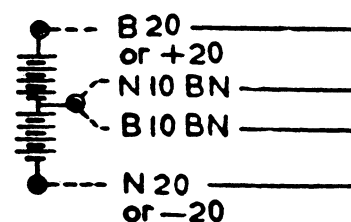


Figure 2

BX100
or
BX10

Indicates connection to the 100 V.
or 10 V. feed busbar or terminal of
an A.C. system.

NX10BNX
OR
BX 90BNX

Indicates connection to the 10 V.
return or 90 V. feed busbar or
terminal of an A.C. system.

NX100
or
NX90

Indicates connection to the 100 V.
or 90 V. return busbar or terminal
of an A.C. system.

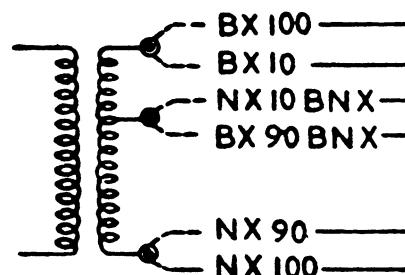


Figure 3

BX110R
BX110Y
or
BX110B

Indicates connection to the 110 V.
feed busbar or terminals phase R, Y
or B, respectively, of a three-phase
A.C. system.

NX110G

Indicates connection to the 110 V.
return neutral busbar or terminal of
a three-phase, star-connected A.C.
system.

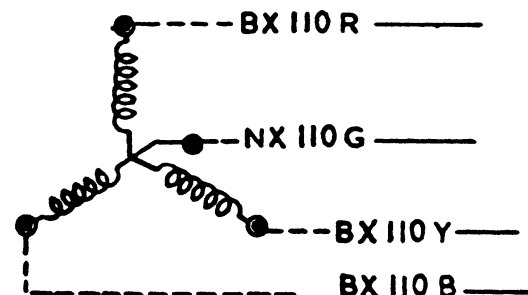


Figure 4

CB10
or
CN10

An illustration of the application of
this nomenclature is given in the
accompanying diagram.

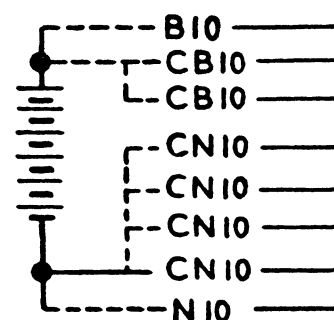


Figure 5

CBX10
or
CNX10

An illustration of the application
of this nomenclature is
given in the accompanying figure.

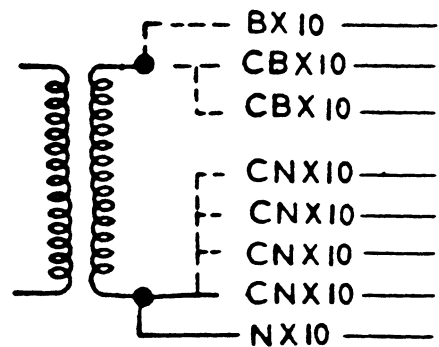


Figure 6

Labelling of wire

In installing a wiring circuit from a wiring diagram, it is very necessary that the installer should clearly understand how the wires are to be run and should be able actually to name each wire. The best practice is also to label each wire so that it can be clearly identified with the corresponding line on the diagram. This applies to both wiring and written circuits.

It should not be necessary, as a general rule, to insert any wire nomenclature on the circuit diagram, as once the system is understood, name can be given to the wire by reference to the units to which it is connected and the circuit of which it forms a part, but testing will be facilitated if every wire is labelled at both ends.

To enable labelling to be applied in a clear and concise manner, the following recommendations are made:

- 1) Each circuit should have a name, generally suggested by the function of the circuit, or the number and name of the operated unit.
- 2) Every apparatus should have a name, number and/or letter. It will be noticed that the terminal nomenclature, whether constituted of numerals or letters, or both, always appears as an index to the main nomenclature.
- 3) Fuses and terminal block should be consecutively numbered or named according to the circuit in which they are provided.
- 4) In the case of a relay, the arm number only will appear in the written circuit diagram, as shown in Figure 8.
- 5) Lever contacts or relay arms should be numbered, the one on the left top, or remote position, being given the lowest number, and the individual terminal should be distinguished by letters. The arm number should precede the contact letter.

For lever contacts, the nomenclature should be:

- L Left or top
- R Right or bottom

For relays or push buttons with hinge or similar contacts, the nomenclature should be:

<i>Non-polarized relays</i>	<i>Polarized relays</i>	<i>Push buttons</i>
F — front or top	N — N position	F — normally made contact
B — back or bottom	R — R position	B — contact made when operated
A — arm	D — de-energized position	A — arm
	A — arm	

Example: 12HR^{3B}

Explanation: Back or bottom contact on No. 3 arm of relay No. 12HR.

Where it becomes necessary to distinguish between various front or back contacts on any one arm, numbers should be used after the letter, the lowest number indicating the left, top or remote contact which has the same letter.

Example: 10HR^{4F2}

Explanation: Front contact No. 2 on the fourth arm of Relay No. 10HR.

6) The terminals connected to the operating portion of the relay should be marked R1, R2, in the case of a single-element relay. In the case of a double-element relay, the local coil should be marked Q1, Q2, and the other coil R1, R2.

7) Where it is necessary to indicate polarity, the left-hand or upper terminal should be the positive.

8) The label should bear the name of the circuit and underneath this the name and/or number of the terminal to which that end of the wire is attached followed by the name and/or number of the terminal to which the other end of the wire is attached.

The following example is taken from Figure 12:

11/12L
ATR^{2A}
11/12 SR^{3F}

9) It may not always be necessary to put all of the above information on the label; provided the terminals to which the wire is to be attached are clearly indicated.

For the sake of clarity, on Fig. 18 are shown examples of the inscriptions on the labels for attaching to the wires in connection with examples on Figure 12.

Written circuits. Explanation of arm position with respect to two and three position armatures and of direction of current

NOTE A numeral under the circuit line indicates the number of the arm and contact in the relay, counting from the left, top or remote position. This also applies to lever bands and other contacts. (See Figure 12 and Figure 13).

a) Contact on non-polarized two-position armature. (General symbol)



b) Contact on polarized two-position armature. (General symbol)

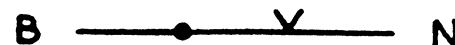


c) Contact on polarized three-position armature. (General symbol)



d) Battery flows from arm to contact (General symbol)

i) Two-position relay

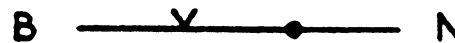


ii) Three-position relay

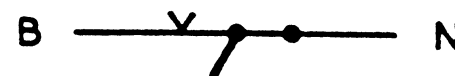


e) Battery flows from contact to arm (General symbol)

i) Two-position relay.



ii) Three-position relay.



Arrangement of symbols

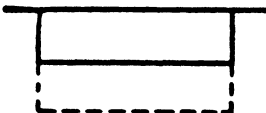
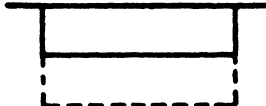
For convenience of reference the symbols have been divided into sections and numbered as follows, a few numbers having been left in each section for additional symbols to be included, if and when necessary:

	Page
Section 10. Electro-magnets (Symbols Nos. 1001–1005)	11
Section 11. Contacts (Relays) (Symbols Nos. 1101–1113)	12
Section 12. Relays (Symbols Nos. 1201–1210)	18
Section 13. Indicators (Symbols Nos. 1301–1313)	20
Section 14. Electric locks and signal disengagers (Symbols Nos. 1401–1406)	24
Section 15. Bells, buzzers and horns (Symbols Nos. 1501–1506)	26
Section 16. Lever and thumb switch contacts (Symbols Nos. 1601–1603)	27
Section 17. Circuit controllers operated by signals, points, etc. (Symbols 1701–1715)	30
Section 18. Contacts and interrupters, various (Symbols 1801–1821)	34
Section 19. Resistors, inductors, and capacitors (Symbols 1901–1911)	41
Section 20. Transformers, motors, generators and general electrical instruments (Symbols 2001–2011)	43
Section 21. Wires, terminals, protection devices, etc. (Symbols 2101–2116)	48
Section 22. Installation symbols (Symbols 2201–2222)	53

Section 10. Electro-magnets

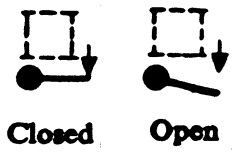
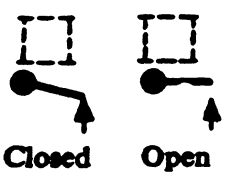
No.	Nomenclature	Description
1001		Electro-magnet.
1002		Electro-magnet, with double winding.
1003		Electro-magnet, slow acting.
1004		Electro-magnetic system, requiring two energized windings.
1005		

Section 10. Electro-magnets

Wiring symbol	Written circuit
	
 Add note if differentially wound.	Each winding shown thus:  The dotted line shows that reference to the other circuit is required.
 Slow release  Slow pick up	 Slow release  Slow pick up
 or   See Figure 13.	Each winding shown thus:  The dotted line shows that reference to the other circuit is required.

Section 11. Contacts (Relays)

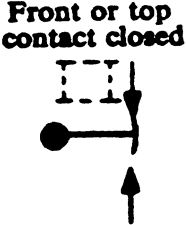
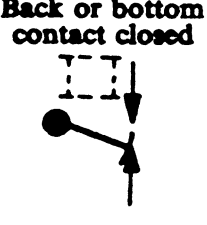
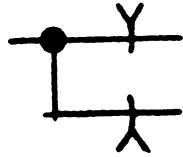
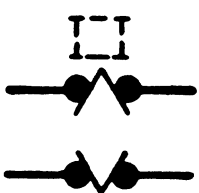
No.	Nomenclature	Description
1101	F	Contacts on non-polarized armature. <i>a.</i> Closed when magnet is energized. ("Front" or "Top" contact).
	B	<i>b.</i> Closed when magnet is de-energized. ("Back" or "Bottom" contact).
	A For the arm	
1102	N	Contact on three-position polarized armature. <i>a.</i> Made only when relay is energized to N position. (N contact).
	D	<i>b.</i> Made only when relay is de-energized. (D contact).
	R	<i>c.</i> Made only when relay is energized to R position. (R contact).
	A For the arm	

Wiring symbol			Written circuit
 Closed Open			
 Closed Open			
N position	D position	R position	
			
			
			

No.	Nomenclature	Description
1103	N	Contacts on two-position armature, either contact remaining closed until relay is operated to the opposite position. <i>a.</i> N contact.
	R	<i>b.</i> R contact.
	A For the arm	
1104	N	Contacts on two-position polarized armature. Biased to one position by magnetism, gravity or spring. Arrow shows direction of bias. <i>a.</i> N contact.
	R	<i>b.</i> R contact
	A For the arm	
1105		Dependent contacts (examples)
1106		Independent contacts (examples).

Wiring symbol			Written circuit		
N position 		R position 			
			Biased to normal 		Biased to reverse
Non-polarized 	Polarized two-position 	Polarized three-position 	Non-polarized 	Polarized two-position 	Polarized three-position

No.	Nomenclature	Description
1107		Bridging contacts on non-polarized armature both contacts closed during movement of armature.
1108	F B	Double break contacts on non-polarized armature. <i>a.</i> Closed when magnet energized. ("Front" or "Top" contact.) <i>b.</i> Closed when magnet de-energized. ("Back" or "Bottom" contact.)
1109		Coding contacts. Non-polarized. Polarized.
1110		Contact fitted with magnetic blow-out.
1111		Contacts on flasher relay.
1112		Searchlight signal. Single dependent contacts.
1113		Searchlight signal. Independent contacts.

Wiring symbol		Written circuit
Front or top contact closed 	Back or bottom contact closed 	
Closed 	Open 