ATW 22001

• SYMBOLS •
RULES & CONVENTIONS

(Incorporating B.S.I. Standards)

for use on

Line Telecommunication Equipment

WIRING DIAGRAMS

ALPHABETICAL INDEX

TO

ATW 22001

ALPHABETICAL INDEX TO ATW 22001 ISSUE 3

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RULES & CONVENTIONS

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Line Telecommunication Equipment

WIRING DIAGRAMS

AGREED
ON BEHALF OF

THE ENGINEER-IN-CHIEF, G.P.O. & THE BRITISH TELEPHONE EQUIPMENT MANUFACTURERS

AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.

SIEMENS BROTHERS & CO. LTD.

ERICSSON TELEPHONES LTD.

STANDARD TELEPHONES AND CABLES LTD.

GENERAL ELECTRIC CO. LTD.

ENGINEER-IN-CHIEF GENERAL POST OFFICE

1950

CHANGE SHEET

(SEE ITEM 0·2·5)

ATW 22001 ISSUE NO.	AMENDMENT PARTICULARS	DATE	APPROVED BY
1	———	24/10/50	R.A.S.
2	CERTAIN PAGES ADVANCED IN ISSUE. INDIVIDUAL ITEMS OR PARAGRAPHS AFFECTED INDICATED BY A STAR. ASN 27/53.	14·3·53	[illegible]
3	CERTAIN PAGES ADVANCED IN ISSUE. INDIVIDUAL ITEMS OR PARAGRAPHS AFFECTED INDICATED BY A STAR. NEW PAGES 1·12 2·9 & 2·10 ISSUED. ASN 261/55	29/2/56	W.A.F.

CONTENTS
AND
CURRENT ISSUE NUMBERS OF PAGES

Continued overleaf.

INTRODUCTION TO ATW 22001

1. General. This document is issued to show the symbols, rules and conventions which have been agreed by the Exchange Wiring Information Sub-Committee (W.S.C.) of the British Telephone Technical Development Committee (B.T.T.D.C.), for the preparation of standardized and semi-standardized wiring diagrams, for use in the manufacture and maintenance of line telecommunication equipment.

In this document, the component designations are in accordance with methods now common in the radio and telecommunications industry.

In ATW 22000, component designations are in accordance with the practices in general use by telephone engineers prior to the adoption by radio and telephone engineers of a common method of designating components [B.S. 530(1948)supplement No. 1(1950)]

The methods adopted in designating components in basic documents will, in general, determine whether the equivalent wiring diagrams are to be in accordance with ATW 22000 or ATW 22001.

2. Diagrams Covered. The diagrams to which this document applies are:-

(a) Routed schematic diagrams, including rack common service diagrams, which show the schematic circuit arrangement with wiring routing details. These diagrams may be either standardized or semi-standardized. (Specimen diagrams see item 0.2.6).

(b) Shelf jack diagrams. These show a conventional view of the shelf jack of the circuit to which they apply and include the rack wiring and cabled connexions that are terminated on that item. This type of diagram may also be prepared for strip mounted sets, in which case the conventional view of the shelf jack is replaced by one of the strip connexion.

These diagrams may be either standardized or semi-standardized. (Specimen diagrams see item 0.2.6).

(c) Cross connexion diagrams. These show the connexions from the circuit to which they apply to the T.D.F., I.D.F. and M.D.F. together with the jumpering required to connect that circuit to associated circuits. They also include strip connexion layout information for the circuit to which they apply.

These diagrams are standardized. (Specimen diagrams see item 0.2.6).

3. Composition of document. This document is composed of nine sections. Each section carries decimal numbering of the individual pages, designed to permit expansion (if necessary), and may be identified by the first figure of the numbering scheme.

(a) Section 1. Symbols and conventions. (Designations, tag numbering or lettering, values etc. typical only).

(b) Section 2. Layouts (not to scale) of items of apparatus.

(c) Section 3. Component designations.

(d) Section 4. Rules applicable to all Routed Schematic, Shelf Jack and Cross Connexion diagrams.

(e) Section 5. Rules applicable to all Routed Schematic diagrams.

(f) Section 6. Rules applicable to Routed Schematic other than Rack Common Service diagrams

(g) Section 7. Rules applicable to Rack Common Service diagrams.

(h) Section 8. Rules applicable to Shelf Jack diagrams.

(j) Section 9. Rules applicable to Cross Connexion diagrams.

4. Application. Details of the circuit arrangement, equipment layout, relay information etc., are contained in basic documents prepared by the G.P.O. The basic diagram (e.g. TL, AT, TG, TP, SA) shows the schematic circuit arrangement, the associated specification (e.g. T, TG, S) gives details of items of equipment to be used, layout of items, cabling terminations etc.

4. (Continued)

Details of wiring, routing, colour codes etc., conforming to the rules of this document together with the basic information are combined for the production of wiring diagrams. Rearrangement of the layout of the diagram and sub-division of figures may, however, be necessary for clarity.

In the symbols section, the symbols and designations are shown full size. When dimensions are given they are for guidance only. Minor variations in size are permissible, in particular when stencils are used. The figures in the small box insets refer to B.S. 530 item numbers. The application of symbols, rules, conventions etc. is illustrated in the specimen diagrams to which reference is made in item 6. The specimen diagrams are issued separately and are full size.

5. Amendments. The document and individual pages will be advanced in issue as each change is made.

When the matter on one page of a sheet which is printed both sides is amended, the complementary page will be advanced in issue also, and recorded as "no amendment".

New and amended items will be starred, the star being removed at the next advance in issue.

Record of all changes is shown in the change sheets.

***6. References**

SPECIMEN DIAGRAMS

ATW 51010	SPECIMEN DIAGRAM FOR PLUG IN APPARATUS (RELAY SET WITH REGENERATOR)
ATW 51030	" " " " " " (1st. CODE SELECTOR)
ATW 51050	" " " STRIP MOUNTED EQUIPMENT (POSITION CIRCUIT, MANUAL POSITION, ETC.)
ATW 51070	" " " A STRIP MOUNTED SET (UNIT AUTO No. XX OUTGOING JUNCTION)
ATU 51080	" SHELF JACK DIAGRAM (2000 TYPE SELECTOR)
AU 51090 51091	" " " " (PRE-2000 TYPE RELAY SET)
ATU 51100 51101	" ROUTINER UNIT STRIP CONNEXION DIAGRAM
ATX 51110	" CROSS CONNEXION DIAGRAM (SUBSCRIBERS LINE CIRCUIT)
ATX 52450	" " " " (RELAY SET)
SAW 80110	" WIRING DIAGRAM FOR PLUG IN APPARATUS (RELAY SET WITH MORE THAN ONE CIRCUIT PER BASE)
TGW 50990	" WIRING DIAGRAM FOR A TELEGRAPH RELAY SET
TLW 31010	" DIAGRAM CHARGEABLE TIME CLOCK CIRCUIT (EQUIPMENT ON M.A.R. AND MANUAL POSITION)
TPW 33010	" " RACK COMMON SERVICES (WIRING COMMON TO APPARATUS ON RACK)

Other basic documents

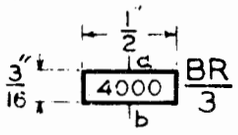
B.S. 530

SYMBOLS

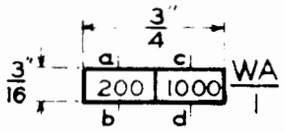
RELAY COILS 600 TYPE

FOR LAYOUTS SEE P. 2·1 ETC.
FOR GENERAL NOTES SEE P. 1·4.

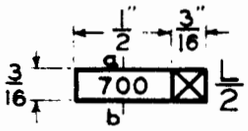
1 WITH ONE WINDING — 37



2 WITH TWO WINDINGS — 37·6



3 WITH FORE END SLUG — 37·2

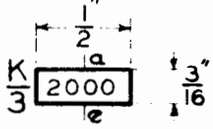


4

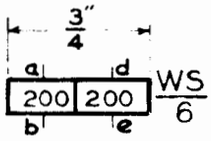
RELAY COILS 3000 TYPE

FOR LAYOUTS SEE P. 2·1 ETC.
FOR GENERAL NOTES SEE P. 1·4

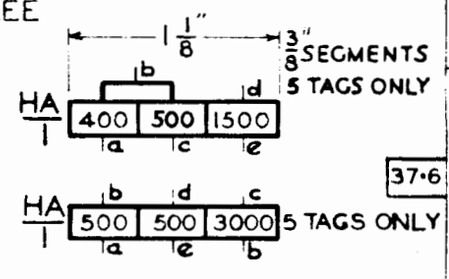
5 WITH ONE WINDING — 37



6 WITH TWO WINDINGS — 37·6

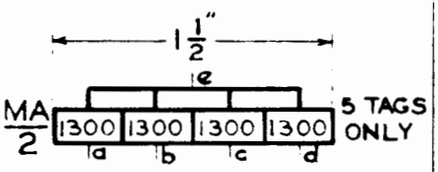


*7 WITH THREE WINDINGS



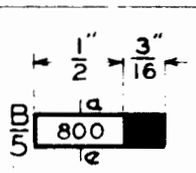
NOTE:- THE COMMON TAG MAY BE SHOWN SEPARATELY FOR EACH WINDING WHEN NECESSARY FOR CLARITY IN DRAFTING, AS IN (b) ABOVE

*8 WITH FOUR WINDINGS

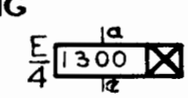


NOTE:- THE COMMON TAG MAY BE SHOWN SEPARATELY FOR EACH WINDING WHEN NECESSARY FOR CLARITY IN DRAFTING (AS ITEM 7b)

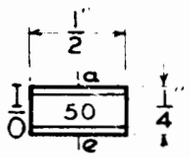
9 SLOW RELEASING (HEEL END SLUG) — 37·1



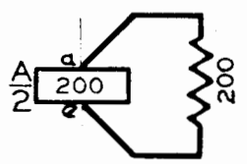
10 SLOW OPERATING (FORE END SLUG) — 37·2



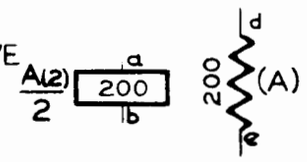
11 HIGH IMPEDANCE (IN SPEECH CIRCUITS ETC) — 37·9



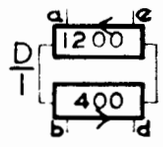
*12 WITH INTEGRAL NON-INDUCTIVE SHUNT



13 WITH SECOND WINDING NON-INDUCTIVE



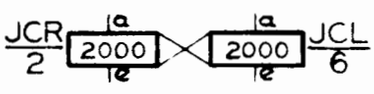
14 SHUNT FIELD — 37·8

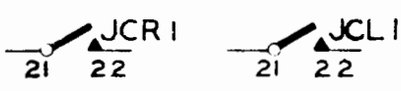


LINE WINDING a-e. NON-OPERATE WITH CURRENT IN DIRECTION OF ARROWS. POLARISING WINDING b-d.

NOTE:- COIL TAG LETTERS & ARROWS OF EITHER COIL MAY BE REVERSED FOR DRAFTING CONVENIENCE.

15 LATCHING





NOTE:- R IS RELEASE COIL
L IS LATCH COIL

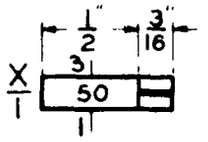
SYMBOLS

RELAY COILS MISCELLANEOUS

FOR LAYOUTS SEE P. 2·1 ETC.
FOR GENERAL NOTES SEE P. 1·4.

1. 37·7

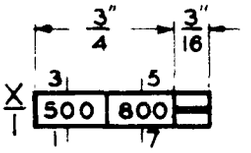
HIGH SPEED WITH SINGLE COIL



OTHER REFERENCE - 2·1·3 & 7

2

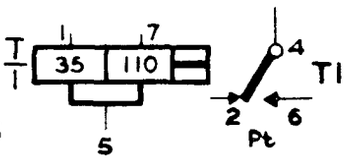
HIGH SPEED WITH DOUBLE COIL



OTHER REFERENCE — 2·1·4 & 8

*3

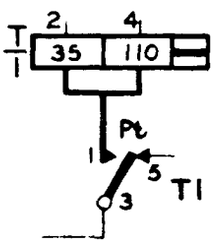
HIGH SPEED P.O. TYPE SINGLE COIL WITH TAPPING



OTHER REFERENCE — 2·1·6

*4

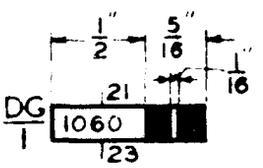
HIGH SPEED SIEMENS TYPE SINGLE COIL WITH TAPPING



OTHER REFERENCE — 2·1·9

5. 37·11

VERY SLOW RELEASING

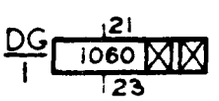


NOTE:- USED FOR THERMAL RELAYS ETC.

OTHER REFERENCE — 2·2·5.

6. 37·21

VERY SLOW OPERATING

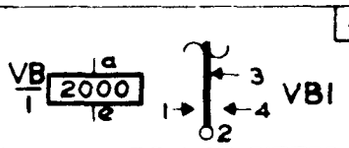


NOTE:- USED FOR THERMAL RELAYS ETC

OTHER REFERENCE — 2·2·5.

7. 43

VIBRATOR

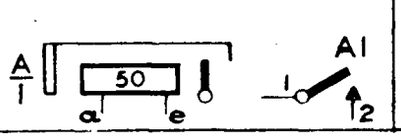


WHEN 1 & 4 ARE NOT FITTED
2 & 3 BECOME 1 & 2

OTHER REFERENCE — 2·2·8

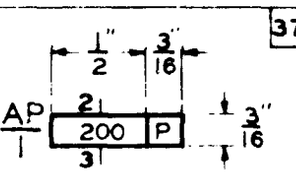
8. 39·2

INDICATOR DROP TYPE



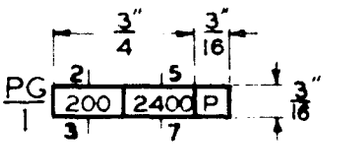
9. 37·3

POLARISED WITH ONE WINDING



10

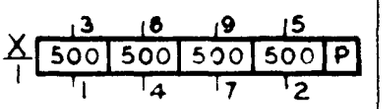
POLARISED WITH TWO WINDINGS



OTHER REFERENCE — 2·2·3

11

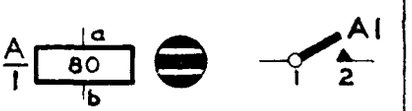
POLARISED WITH FOUR WINDINGS



OTHER REFERENCE — 2·2·4

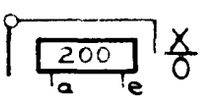
12. 39·1

INDICATOR FLAG OR DOLL'S EYE TYPE



13

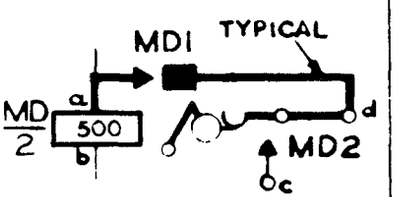
TRIP COIL OR SOLENOID



OPENS THE LATCH WHEN ENERGISED

14

10 STEP RELAY



OTHER REFERENCE — 2·2·6

15. 38

METER

OTHER REFERENCE — 2·2·7

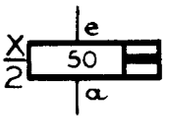
RELAY COILS MISCELLANEOUS (CONT'D)

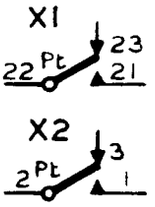
FOR LAYOUTS SEE P. 2·1 ETC,
FOR GENERAL NOTES SEE P.1·4.

* 1

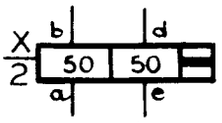
HIGH SPEED WITH TWO CHANGE-OVERS.

WITH ONE WINDING

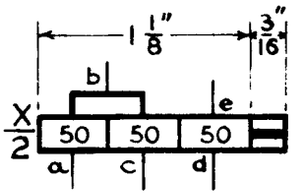




WITH TWO WINDINGS



WITH THREE WINDINGS



OTHER REFERENCES — 1·1·7, 1·4·10 & 2·1·5

NOTES CONCERNING RELAY COILS

Coils with separate N.I. windings

1. When a relay includes an N.I. winding brought out to separate tags, that winding is indicated by "(2)" adjacent to the relay designation as in item 1.1.13.

Coil Windings

2. On 3000 type relays all coils are wound in the same direction. The inner (start) end of any winding is connected to the tag first in the alphabetical sequence of tag designations allocated for the particular winding. The outer (finish) end is connected to the second tag allocated for the winding in the alphabetical sequence. Relays with three or more coils require two or more winding-ends brought to a common tag or tags. Any tag may be used as a common, depending on constructional design.

3. On 600 type relays all coils are wound in the same direction. On a relay with one winding tag "a" is the inner (start) end and tag "b" the outer (finish) end of the winding. On a relay with two windings, tags "a" and "c" are inner (start) ends and tags "b" and "d" are outer (finish) ends of the windings.

4. When the function of the relay permits, earth shall be wired to the inner end and battery to the outer end of the winding.

Tag Allocation

5. Allocation of tags shall comply with the relevant relay card.

Coil Resistances

6. The resistance in ohms shall be inserted in the rectangle.

7. If the resistance of a coil is varied (to suit varying conditions) the different values of resistance shall be shown as detailed in 5.1.5.

Differentially Connected relays

8. Differentially connected relays to be indicated by note on Routed Schematic Diagrams.

Slow Relays etc.

9. The convention indicating that relays are Slow Operating, Slow Release, High Speed and Polarised etc. may be shown at either end of the coil symbol as may be necessary in drafting.

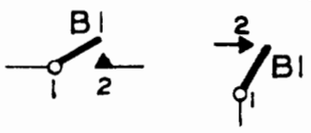
High Speed Relays with Two Change-overs

10. On this relay, coil tags are designated in alphabetical sequence as for 3000 type relays, but when a relay has two coils, tags "a" and "e" are inner (start) end of windings.

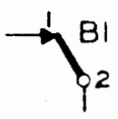
SPARE

RELAY CONTACTS

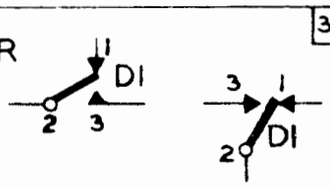
1 MAKE 36·2



2 BREAK 36·1

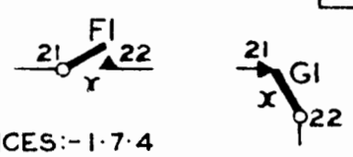


3 CHANGE OVER GENERAL USE 36·4



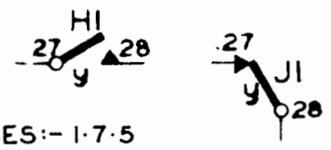
4 MAKE BEFORE BREAK 36·3

5 'x' CONTACT 36·5



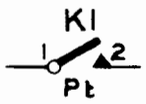
OTHER REFERENCES:- 1·7·4

6 'y' CONTACT 36·6



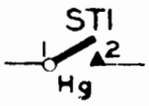
OTHER REFERENCES:- 1·7·5

* 7 PLATINUM CONTACT 36·7



OTHER REFERENCES:- 1·7·7

* 8 MERCURY CONTACT 36·8

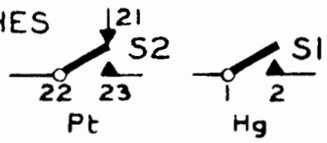


OTHER REFERENCES:- 1·7·7

* 9 TUNGSTEN CONTACT

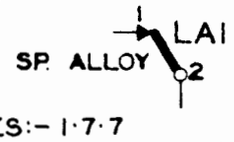
OTHER REFERENCES:- 1·7·7

* 10 RELAY SWITCHES PLATINUM & MERCURY CONTACTS



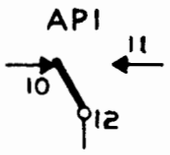
OTHER REFERENCES:- 1·7·7

* 11 SPECIAL ALLOY CONTACT



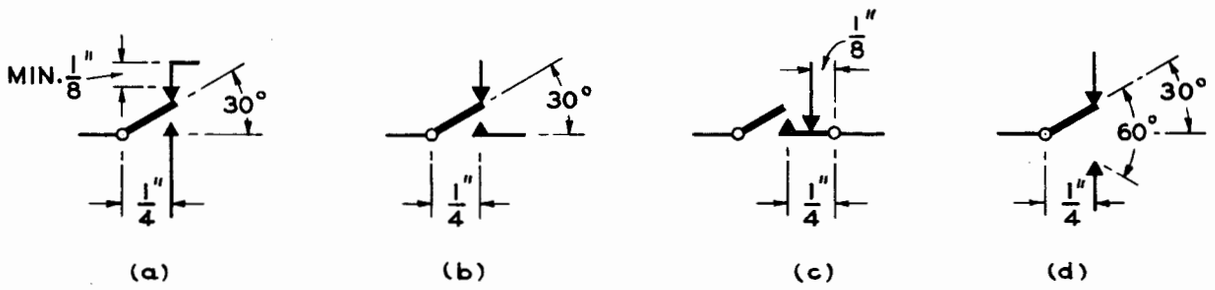
OTHER REFERENCES:- 1·7·7

* 12 CHANGE OVER SYMMETRICAL



OTHER REFERENCES 1·7·1

RELAY CONTACT CONSTRUCTIONAL DETAILS



* 1. Contact units of make, break, change-over or make-before-break types shall conform in size to the examples (a), (b) or (c). Symmetrical contact units shall conform in size to example (d) which shall be used for polarized relays having symmetrical operating characteristics.

* 2. The conductors shall be drawn as shown and shall not be turned at an angle until at least 1/8" from the contact.

* 3. Any make spring conductor, except of a symmetrical contact, may be drawn as shown in either example (a) or (b).

NOTES CONCERNING RELAY CONTACTS

4. A relay "x" contact is one which, by mechanical design of the relay, is arranged to operate before all other contact units on the relay, and to release after all other contact units on the relay.

5. A relay "y" contact is one which, by mechanical design of the relay, is arranged to operate after all other contact units on the relay, and to release before all other contact units on the relay.

*6. *Transferred to item 5.2.15.*

7. Relay spring contacts of material other than P.G.S. or silver shall be indicated by the chemical symbol or other special designation.

8. When only one springset is fitted on a relay the spare position may be occupied by a terminal assembly the tags of which shall be numbered in a manner similar to a normal spring pile.

9. All spare springs shall be shown and numbered on the diagram.

*10. *Deleted.*

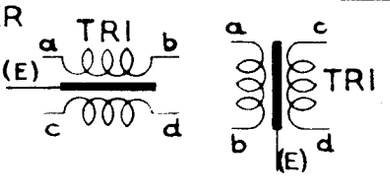
*11. *Included in item 1.7.1.*

SYMBOLS

TRANSFORMERS & INDUCTORS (RETARDS & CHOKES)

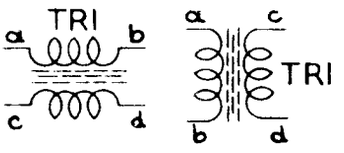
1 — 29

TRANSFORMER WITH IRON CORE



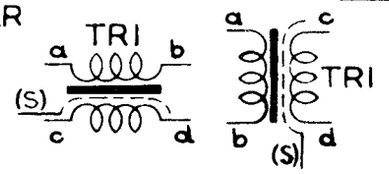
2

TRANSFORMER WITH DUST CORE



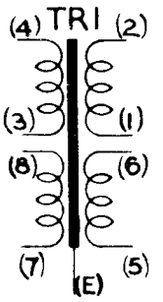
3 — 29·1

TRANSFORMER WITH SCREENED WINDING



4a

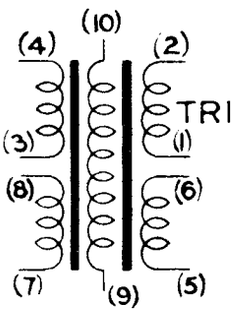
REPEATING COIL OR LINE TRANSFORMER



OTHER REFERENCE — 3.6.8(d)

4b

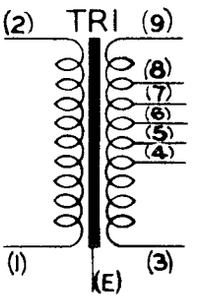
LINE TRANSFORMER WITH TONE COIL



OTHER REFERENCE — 3.6.8(d)

5

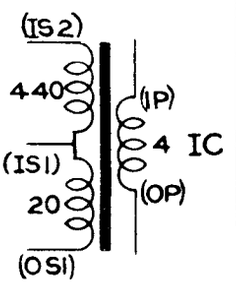
TRANSFORMER WITH MULTI-TAPPED WINDING



OTHER REFERENCE — 1.34.1

6

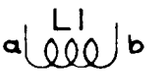
OPERATOR'S INDUCTION COIL P.O. No. 3/16



OTHER REFERENCE — 3.6.8(d)

7 — 27

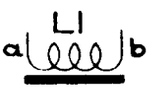
INDUCTOR



8a — 27·2

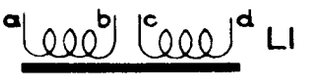
INDUCTOR WITH IRON CORE

(FOR RELAY USED AS RETARD SEE ITEM 1·1·11)



8b

BALANCED INDUCTOR.

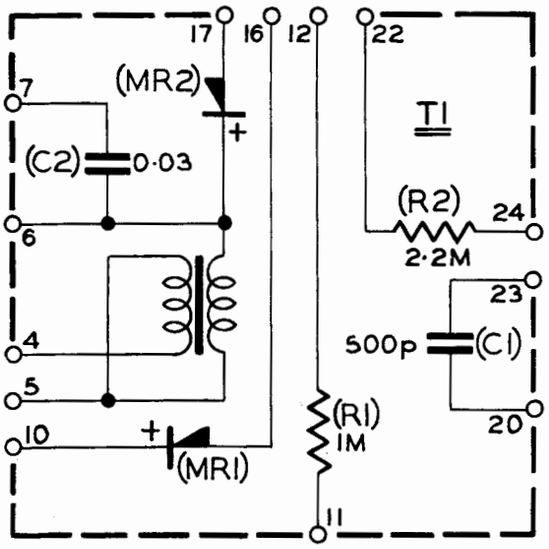


*9 DELETED

*10 DELETED

TRANSFORMERS & INDUCTORS (RETARDS & CHOKES) (CONTINUED)

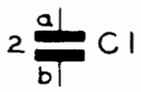
*1
TRANSFORMER ASSEMBLY



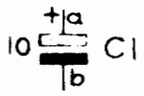
OTHER REFERENCES:- 3·6·8(e)

CAPACITORS

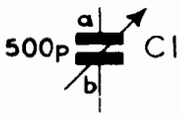
1 GENERAL SYMBOL — 26



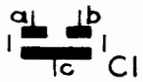
2 ELECTROLYTIC — 26·5



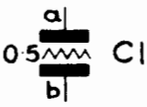
3 VARIABLE — 26·1



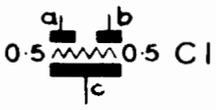
4 THREE-TERMINAL TWIN — 26·3



5 WITH INTENTIONAL INHERENT SERIES RESISTANCE — 26·4



6 THREE-TERMINAL TWIN WITH INTENTIONAL INHERENT SERIES RESISTANCE — 26·41

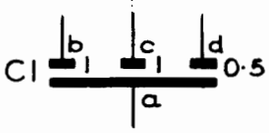


7 DELETED

8 DELETED

9 DELETED

10 FOUR TERMINAL TRIPLE



11 VALUES

CAPACITANCE VALUES SHOULD BE SHOWN THUS:-

UP TO 999pF. — THE NUMBER OF pF FOLLOWED BY p., e.g. 220p.

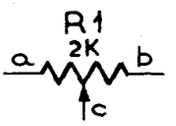
1000pF UPWARDS — THE NUMBER OF µF., e.g. 0·5, 2·5.

RESISTORS

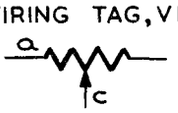
1. GENERAL SYMBOL — 25

2. VARIABLE — 25·11

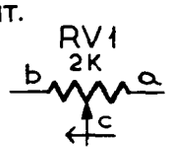
(a)



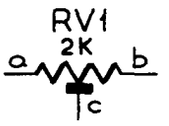
(b) THE LETTER b IS OMITTED WHEN THIS END OF THE RESISTOR IS NOT TERMINATED ON A WIRING TAG, VIZ.,



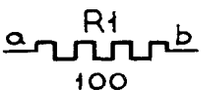
(c) WHEN NECESSARY THE EFFECT OF CLOCK WISE ROTATION OF THE OPERATING CONTROL IS INDICATED BY AN ARROW DRAWN ACROSS THE VARIABLE CONNEXION. THE EXAMPLE SHOWN INDICATES AN INCREASE IN RESISTANCE ACROSS TAGS a AND c IF CLOCKWISE ROTATION PRODUCES A DECREASE IN RESISTANCE ACROSS TAGS a AND c THE ARROW WOULD BE DRAWN POINTING TO THE RIGHT.



3. PRE-SET VARIABLE — 25·12



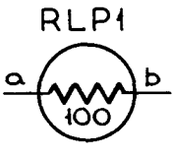
4. SPECIALLY NON-REACTIVE FOR PURPOSE FOR WHICH IT IS USED — 25·2



*5. RENUMBERED 1·11·12(a)

*6. RENUMBERED 1·11·12 (b)

*7. RESISTOR BULB OR LAMP — 505



*8. RENUMBERED 1·12·3

9. VALUES:— RESISTANCE VALUES SHOULD BE SHOWN THUS:—

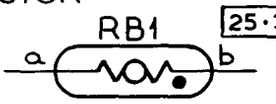
UP TO 999 OHMS: THE NUMBER OF OHMS. eg. 220.
1.000 TO 999,999 OHMS: THE NUMBER OF THOUSANDS FOLLOWED BY K, e.g. 27K, 1·15K.
1 MEGOHM UPWARDS: THE NUMBER OF MEGOHMS FOLLOWED BY M, e.g. 2·2M.

*10. RENUMBERED 1·12·1

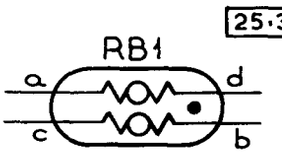
*11. RENUMBERED 1·12·2

*12. DEVICE WITH PRONOUNCED POSITIVE RESISTANCE/TEMPERATURE CHARACTERISTIC
e.g. BALLAST RESISTOR

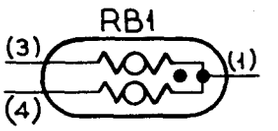
(a) SINGLE FILAMENT — 25·31



(b) TWO FILAMENTS — 25·32



(c) TAPPED FILAMENT

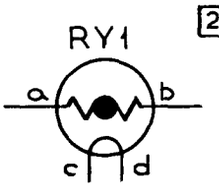


NOTE:— WHERE BALLAST RESISTOR IS PLUG-IN TYPE, HOLDER TAG NUMBERS REPLACE RESISTOR TAG LETTERS e.g. AS IN (c) ABOVE
OTHER REFERENCES:—1·28·1(a), 2·7·4 & 2·8·1.

*13. DEVICE WITH PRONOUNCED NEGATIVE RESISTANCE / TEMPERATURE CHARACTERISTIC
e.g. THERMISTOR

(a) DIRECTLY HEATED

(b) INDIRECTLY HEATED — 25·4



SYMBOLS

ELEMENTS WITH NON-LINEAR CURRENT / VOLTAGE CHARACTERISTICS

ASYMMETRICAL (RECTIFIER ELEMENTS)

70·2

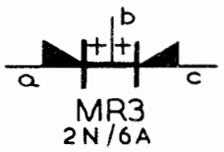
*1. GENERAL SYMBOL

HIGHER CONDUCTIVITY IS OBTAINED WHEN THE TRIANGLE IS POSITIVE WITH RESPECT TO THE PLATE.

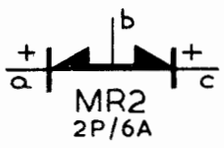
2. TYPICAL EXAMPLES OF MULTI-UNIT TYPES.

(a) TWO UNIT (SAME SENSE)

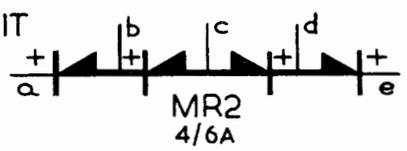
(b) TWO UNIT (OPPOSING SENSE)



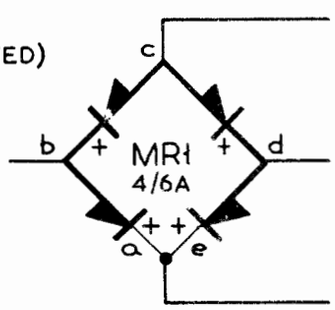
(c) TWO UNIT (OPPOSING SENSE)



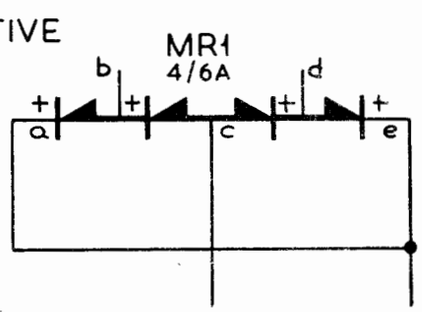
(d) FOUR UNIT



(e) FOUR UNIT (BRIDGE CONNECTED)



(f) ALTERNATIVE FOR (e)



SYMMETRICAL

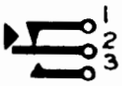
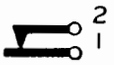
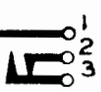
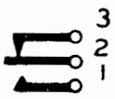
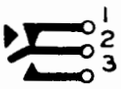
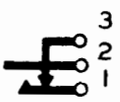
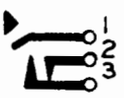
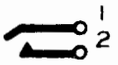
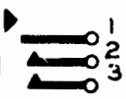
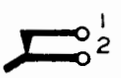
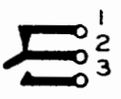
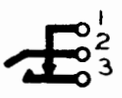
70·1

3. GENERAL SYMBOL

SYMBOLS

KEY UNITS

FOR LAYOUTS SEE PAGE 2·3

LEVER TYPE	PLUNGER TYPE
1 NON-LOCKING MAKE KRAI 	9 NON-LOCKING CHANGE-OVER KPPI 
2 NON-LOCKING BREAK KDAI 	10 NON-LOCKING MAKE BEFORE BREAK KFCI 
3 NON-LOCKING CHANGE-OVER KFLI 	11 LOCKING CHANGE-OVER KTPI 
4 NON-LOCKING MAKE BEFORE BREAK KSAI 	12 LOCKING MAKE BEFORE BREAK KSAI 
5 LOCKING MAKE KEFI 	13 NON-LOCKING DOUBLE MAKE (BUNCHING) KASI 
6 LOCKING BREAK KRCI 	14 SYMBOLS FOR OTHER UNITS OF PLUNGER TYPE KEYS ARE AS FOR LEVER TYPE BUT WITH THE ADDITION OF THE SOLID TRIANGLE ADJACENT TO THE MOVING SPRING CONVENTION.
7 LOCKING CHANGE-OVER KSTI 	15
8 LOCKING MAKE BEFORE BREAK KSAI 	16

SYMBOLS

JACKS

FOR SHELF JACKS SEE P. 1·17

FOR LAYOUTS SEE P. 2·3. FOR GENERAL NOTES SEE P. 1·17.

1
TWO POINT JACK

2
THREE POINT JACK

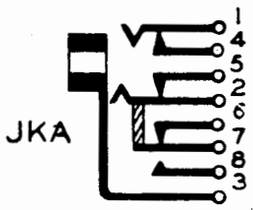
33·3

3
BREAK JACKS

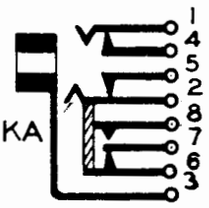
33·31

P.O. No. 500

P.O. No. 800.

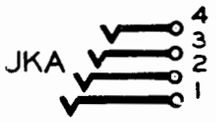


P.O. No. 810.



4
OPERATORS JACK

33·4



No. 4 IS TIP SPRING.

5
MULTI-POINT JACK

(EXAMPLE: FIVE WAY)

33·4

6

7

8

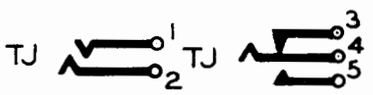
TEST JACKS

9
ISOLATION JACK

10
UNISELECTOR TEST JACK

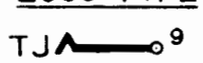
11
SELECTOR & RELAY-SET TEST JACK

PRE 2000 TYPE

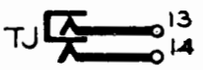


2000 TYPE

(a) SINGLE



(b) WITH LINK

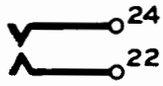


OTHER REFERENCES:- 1·17·9.

*12
ROUTINE TEST JACK

(a) WITH BREAK CONTACTS

(b) WITHOUT BREAK CONTACTS



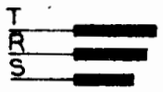
SPARE

SYMBOLS

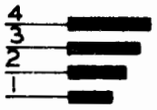
PLUGS, CLIPS, ETC.

FOR SHELF PLUGS SEE P.1-17.

1 SWITCHBOARD 34-1



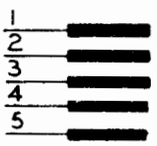
2 OPERATORS PLUG 34-1



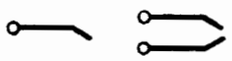
NO. 4 IS TIP

3 MULTI-POINT 34-2

(EXAMPLE:-FIVE WAY)

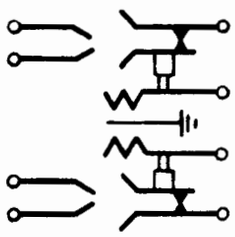


*4 PROTECTOR TEST PLUG 56-2

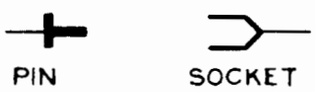


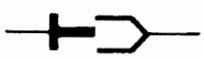
(a) SINGLE (b) TWIN

(c) (EXAMPLE OF USE)



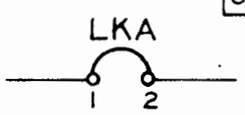
*5 PIN & SOCKET (TEST TYPE) 35-2



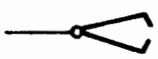


PIN & SOCKET

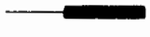
6 'U' LINK OR WIRE LINK 8-1



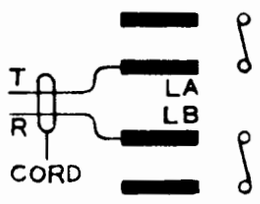
*7 CONNEXION CLIP 56-3



*8 FUSE TEST CLIPS

(a) 

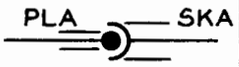
(b) EXAMPLE OF USE



*9 PLUG & SOCKET (POWER TYPE)

(a) PLUG & SOCKET

(b) PLUG & SOCKET SHROUDED



SYMBOLS

PLUG & JACK CONNEXIONS

FOR LAYOUT SEE SECTION 2

*1 9·1, 9·2

PLUG-IN POINT (U POINT)
FOR RELAY SETS AND SELECTORS

(a) SYMBOL

(i) FOR REGULAR ACCESS — 2 / V

(ii) FOR ROUTINER ACCESS — Y_2

(b) DESIGNATION CONVENTIONS.

(i) WHERE MORE THAN ONE PLUG-IN UNIT PER FIG. APPEARS ON THE DIAGRAM.

1ST. UNIT — 2 / V

2ND. UNIT — (2) / V

3RD. UNIT — ⓶ / V

(ii) WHERE MORE THAN ONE CIRCUIT PER BASE IS PROVIDED. THE U-POINT NUMBERS ARE ARRANGED OUTWARD FROM THE SYMBOL, COMMENCING WITH THAT OF THE 1ST. CIRCUIT.

e.g. 20 / 16 / 8 / 4 / V OR 20.16.8.4>

OTHER REFERENCES: 1·32·9 (a), 1·17·10.

*2. TRANSFERRED TO 2·9·1.

*3. TRANSFERRED TO 2·9·1.

*4. TRANSFERRED TO 1·17·10

*5. 9·1

PLUG-IN POINT FOR REGENERATORS, DIAL MOUNTINGS AND MECHANICAL KEYSENDERS, PLUG-IN RELAYS, MACHINES, KEY UNITS, CHARGEABLE TIME CLOCKS.

[2] / V

OTHER REFERENCE: 1·17·10

6.

NOTES CONCERNING JACKS & PLUGS

7
THE SLEEVE CONNEXION IN THE SYMBOL FOR SWITCHBOARD TYPE JACKS MAY BE SHOWN ABOVE THE SPRINGS IF NECESSARY FOR CONVENIENCE IN DRAFTING.

8
WHEN EARTH IS REQUIRED ON U/S TEST JACKS IT SHALL BE CONNECTED TO SPRING No. 1.

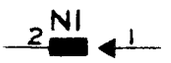
9
SPRINGS OF TEST JACKS & PLUGS SHALL BE NUMBERED IN ACCORDANCE WITH P.O. SPECIFICATION T1545 & T1565 FOR CHANNEL TYPE & TP 3009 & TP 3010 FOR 2000 TYPE. ALL SPARE SPRINGS SHALL BE SHOWN & NUMBERED. ALL SPARE UNITS SHALL BE LOCATED NEAR THE INSET BOX.

*10
(a) SHELF JACK & PLUG NUMBERS ARE PREFIXED BY THE LETTER U IN WIRING RUNS e.g. U2.
(b) OTHER JACK & PLUG NUMBERS ARE PREFIXED BY THE APPROPRIATE COMPONENT DESIGNATION IN WIRING RUNS e.g. ADA [2].

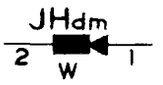
MECHANICALLY OPERATED CONTACTS

FOR MOTOR UNISELECTOR CONTACTS SEE p.1·22

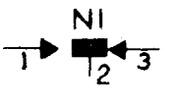
1 MAKE CONTACT 62·2



2 BREAK CONTACT 62·1

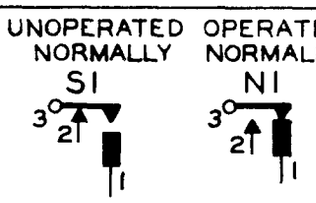


3 CHANGE OVER OTHER THAN 2000 TYPE INTERRUPTER 62·4

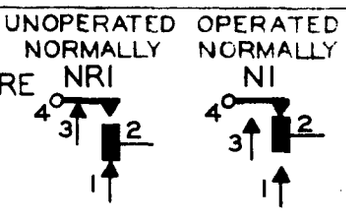


4 CHANGE OVER 2000 TYPE INTERRUPTER

5 MAKE BEFORE BREAK CONTACT 62·3



6 BREAK & MAKE BEFORE BREAK CONTACT



7 NOTES ON ITEMS 1-6

(a) FOR LAYOUT OF MECHANICALLY OPERATED SPRING SETS SEE p.2·4

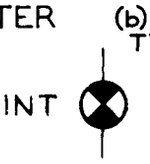
(b) MECHANICAL SPRING CONTACT MATERIAL IS P.G.S. FOR SINGLE CONTACTS & SILVER FOR TWIN CONTACTS UNLESS OTHERWISE INDICATED BY CHEMICAL SYMBOL, e.g., ITEMS 2 & 4 ABOVE.

(c) CONTACT UNITS SHALL BE SHOWN IN THE POSITION THEY ASSUME WITH THE SWITCH IN THE NORMAL (UNSEIZED) CONDITION.

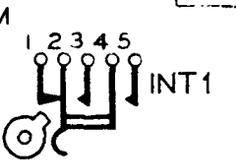
(d) MOVING SPRING OF MECHANICALLY OPERATED CONTACTS IS ALWAYS REPRESENTED BY THE RECTANGLE.

8 INTERRUPTER 52

(a) ROTARY TYPE



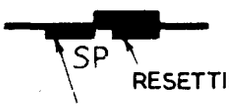
(b) CAM TYPE



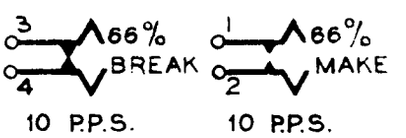
FOR CONVENIENCE IN DRAFTING, SPRING-SETS MAY BE DETACHED.

CAMS SHALL BE SHOWN FOR EACH DETACHED UNIT.

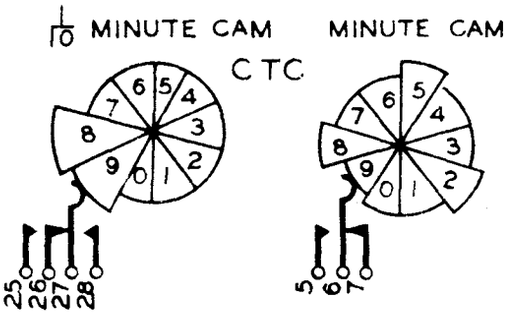
*9 RESETTING PLUNGER & MARKED CODE PIN (PULSE REGENERATOR)



*10 PULSING SPRINGS 61

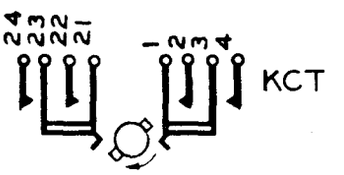


11 CLOCK 44

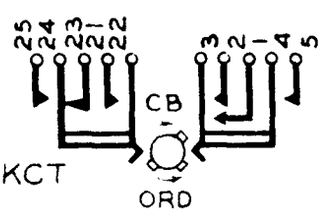


USED WITH EITHER

(a) TWO POSITION START KEY



(b) THREE POSITION (UNIVERSAL) START KEY



NOTES:-

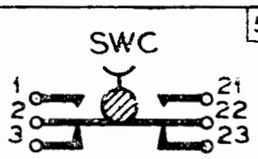
1. IF NECESSARY KEY UNITS MAY BE SHOWN DETACHED.
2. FOR CONVENIENCE IN DRAFTING, SPRINGSETS MAY BE SHOWN DETACHED. CAMS SHALL BE SHOWN FOR EACH DETACHED UNIT

SEE LAYOUT 2·7·1

TELEPHONE INSTRUMENT ITEMS

1 CRADLE SWITCH

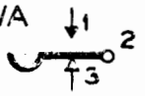
57·2



THE CONTACTS ARE SHOWN IN THE NORMAL POSITION i.e., WITH THE HANDSET ON THE CRADLE. SPRINGS MAY BE SHOWN DETACHED.

2 SWITCH-HOOK

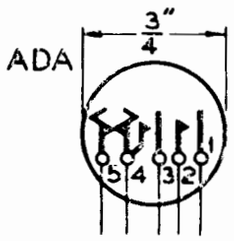
57·1



THE CONTACT IS SHOWN IN THE NORMAL POSITION i.e., WITH THE RECEIVER ON THE REST.

3 DIAL

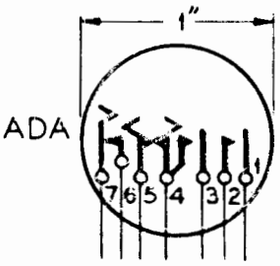
63·3



THE OFF-NORMAL SPRINGS MAY BE SHOWN DETACHED FOR CONVENIENCE IN DRAFTING.

OTHER REFERENCES:- 2·7·2

4 DIAL WITH AUXILIARY SPRINGS

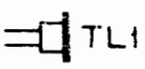


THE OFF-NORMAL SPRINGS MAY BE SHOWN DETACHED FOR CONVENIENCE IN DRAFTING.

OTHER REFERENCES:- 2·7·2

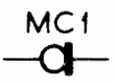
5 RECEIVER

59



6 MICROPHONE

58



7

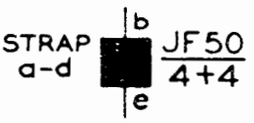
8

SELECTORS

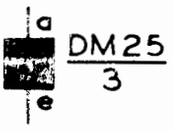
*9 DRIVE MAGNETS

66·4

(a) UNISELECTOR, TWIN COIL

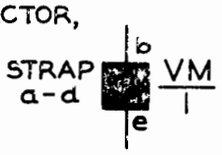


(b) UNISELECTOR, SINGLE COIL



(c) TWO MOTION SELECTOR, TWIN COIL

66·1



(d) TWO MOTION SELECTOR, SINGLE COIL

*10. INCLUDED IN 1·19·9

SELECTORS (CONTINUED)

64·1 | 64·2 | 64·11

*1. UNISELECTOR BANKS & WIPERS

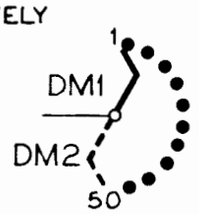
(a) WITH ONE DOUBLE-ENDED WIPER PASSING OVER ONE ARC.

(i) NON BRIDGING

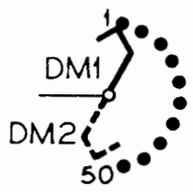
(ii) BRIDGING

(b) WITH PAIR OF SINGLE-ENDED WIPERS PASSING CONSECUTIVELY OVER TWO ARCS.

(i) NON BRIDGING

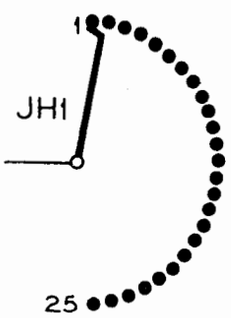


(ii) BRIDGING



OTHER REFERENCES – 1·24·2 & 3

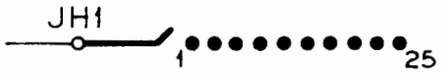
2. BANK ARC, 25 POINT. (FULL SYMBOL)



OTHER REFERENCES – 1·24·2 & 3

*3. BANK ARC

ALTERNATIVE TO 1 ABOVE



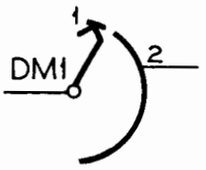
OTHER REFERENCES – 1·24·2

4.

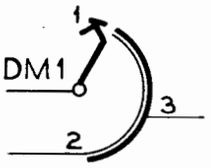
64·31 | 64·3

*5. UNISELECTOR WITH HOMING ARC.

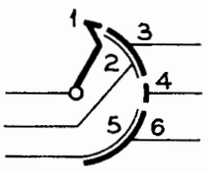
(a) WITH SOLID METAL SEGMENTS



(b) WITH DOUBLE METAL SEGMENTS



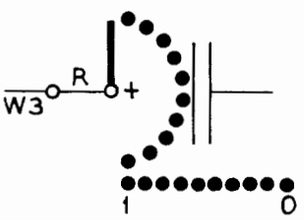
(c) WITH SECOND HOME POSITION



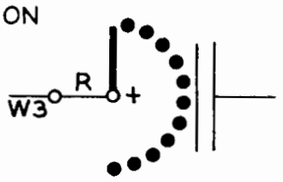
65·1

*6. TWO MOTION SELECTOR BANKS & WIPERS

(a) WITH WIRING ON 11TH. CONTACTS.



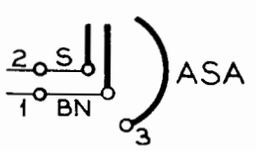
(b) WITHOUT WIRING ON 11TH. CONTACTS.



OTHER REFERENCES – 1·24·5

65·3

*7. AUXILIARY SCREW ARC



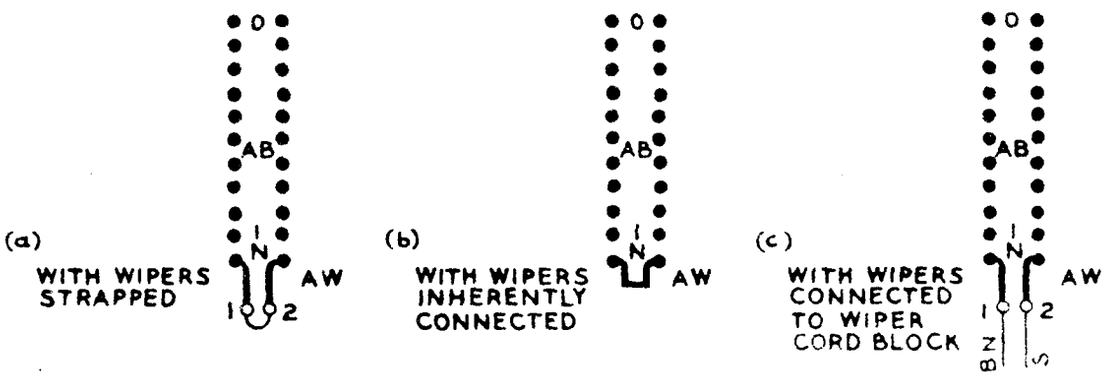
8.

SELECTORS (CONTINUED)

1

65·4

VERTICAL MARKING BANK & WIPER



OTHER REFERENCES:— 1·24·6

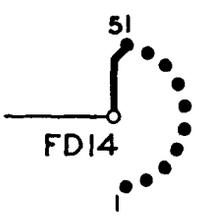
2

MOTOR UNISELECTOR

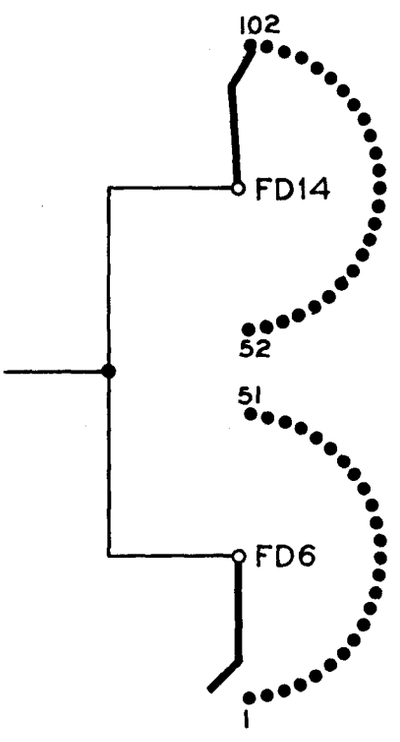
*3

BANKS AND WIPERS (ABRIDGED SYMBOLS)

(a)



(b) PAIR OF SINGLE ENDED WIPERS PASSING OVER TWO ARCS CONSECUTIVELY.

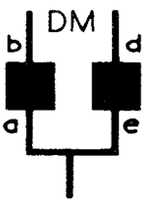


(c) ALTERNATIVE TO (a)

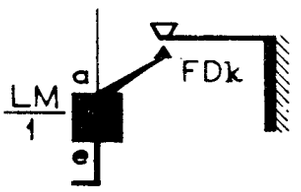
OTHER REFERENCES:— 1·24·4

MOTOR UNISELECTOR (CONTINUED)

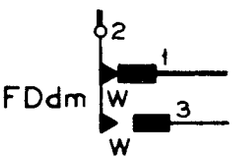
1
DRIVE MAGNET



2
LATCH MAGNET & TEST KEY

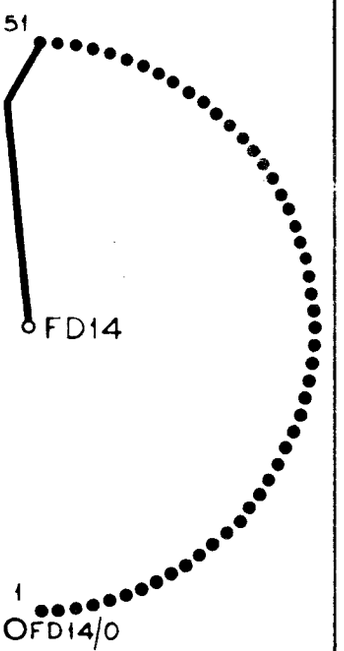


3
DRIVE MAGNET INTERRUPTER



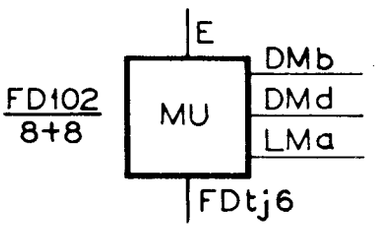
4
MECHANICAL CONTACTS

*5
BANK ARC 51 POINT (FULL SYMBOL)

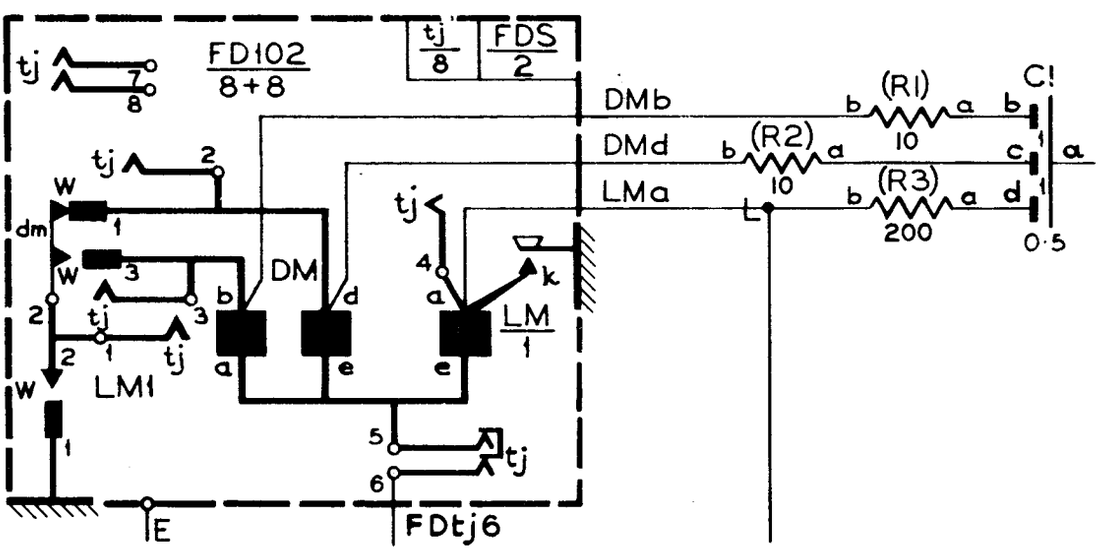


OTHER REFERENCES:- 1·24·4

6
ABRIDGED SYMBOL



7
TYPICAL APPLICATION



THICK LINES INDICATE INTERNAL WIRING OR INHERENT CONNEXIONS, ALL OTHER WIRING TYPICAL ONLY.

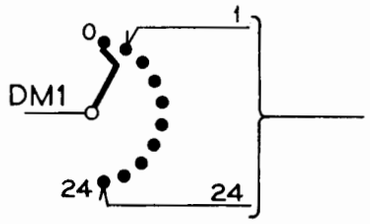
OTHER REFERENCES— 2·6·5

SELECTORS (CONTINUED)

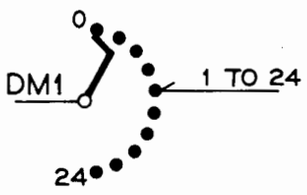
*1. UNISELECTOR & MOTOR UNISELECTOR. TYPICAL METHODS OF SHOWING CONNEXIONS TO ABRIDGED BANK SYMBOLS.

(a) SIMILAR CONNEXIONS TO A NUMBER OF CONSECUTIVE CONTACTS.

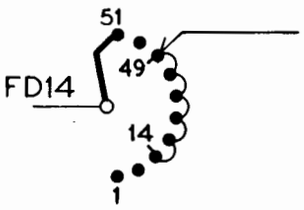
(i)



(ii)

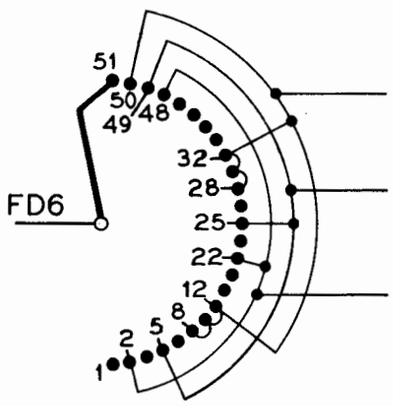


(b) SINGLE CONNEXION COMMONED TO A NUMBER OF CONSECUTIVE CONTACTS.

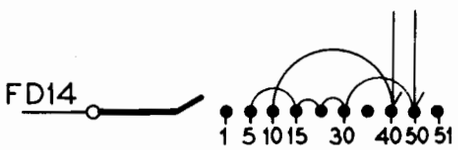


(c) CONNEXIONS, EACH COMMONED TO CONSECUTIVE OR NON-CONSECUTIVE CONTACTS.

(i)



(ii)



N.B. THE 'MULTIPLE' CONNEXION IS INCLUDED ONLY WHEN REQUIRED.

NOTES ON BANKS AND WIPERS OF UNISELECTORS, TWO MOTION SELECTORS, MOTOR UNISELECTORS, AND VERTICAL MARKING BANKS

General

* 1. Spare banks, arcs and wipers shall be shown and numbered on the diagram.

Uniselectors

* 2. Uniselector Banks shall, in general, be represented by items 1.20.1 and 1.20.3 but when it is necessary to show the full complement of bank contacts the banks shall be represented by item 1.20.2.

* 3. Bank contacts are numbered 1 to 25 or 1 to 50 except where the 1st working outlet is on the 2nd physical contact, then the numbering is 0 to 24 or 0 to 49.

Wipers and arcs are numbered from the number wheel.

Motor Uniselectors

* 4. Motor uniselector banks shall, in general, be represented by item 1.21.3 but when it is necessary to show the full complement of contacts item 1.22.5 shall be used. Bank contacts are numbered 1 to 51 or 1 to 102. Bank tags are numbered 0 to 51 or 0 to 51, 0, 52 to 102, the arc numbers being used to identify the particular 0 tags. Bank tag 0 has no corresponding contact. The 26 marking tags, arranged in an arc to the left hand, rear view, of the bank contact tags, are divided into a lower group numbered 1-10 and an upper group numbered 11-26 numbering being from the bottom upwards.

Wipers and arcs are numbered from the number wheel.

Two Motion Selectors

* 5. For Two Motion Selector banks and wipers the cord block numbers and wiper cord colours shall be to T 1545 for channel type and to TP 602 for 2000 type.

Banks and wipers are numbered upwards.

Vertical Marking Bank and Wiper

6. Wiper No. 2 of the Vertical Marking Bank is at the rear of the bank. Commoning is done on the rear bank.

* 7. *Deleted.*

SPARE

PROTECTORS & GUARDS

*1 — 53 & 53·1

FUSE

(a)

FSI
(SEE NOTE 2)

(b) WITH ALARM CONTACT

FSI
(SEE NOTE 3)

NOTES :–
1. COMPONENT & TAG DESIGNATIONS SHOULD BE OMITTED EXCEPT WHEN CONFUSION MAY ARISE.
2. TAG DESIGNATION: 'a' ON BATTERY OR SUPPLY END AND 'b' ON FEED END.
3. TAG DESIGNATION: 'a' ON ALARM CONTACT END, 'b' ON NON-CONTACT END AND 'c' ON ALARM BAR.

2 — 54·1 & 54·2

HEAT COIL

(a) BREAK TYPE — HC 1

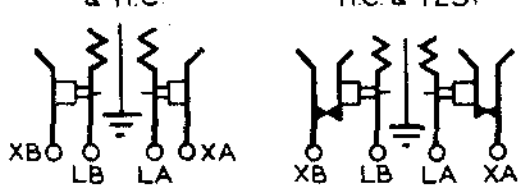
(b) COMPRESSION TYPE — HC 1

*3 — 56 & 56·1

M.D.F PROTECTOR

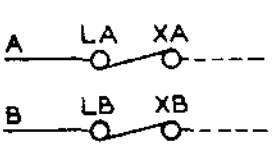
(a) PROTECTOR & H.C.

(b) PROTECTOR, H.C. & TEST



*4

M.D.F. FUSE



5

PROTECTORS, GAS FILLED

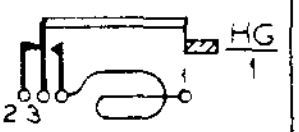
FOR GAS FILLED PROTECTORS SEE SYMBOL p. 1·28. 9(g)

6

AUDIBLE & VISIBLE CALLING EQUIPMENT

7 — 45 21

HAND GENERATOR



CONTACTS AS REQUIRED

*8 — 40·1, 40·2 & 40·11

BELL

(a) D.C. BL1 (a, b)

(b) A.C. BL1 (a, b)

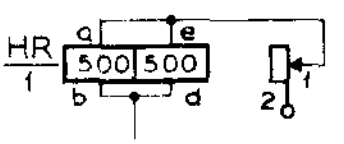
(c) SINGLE STROKE BL1 (a, b)

*9 — 41·1 & 41·2

BUZZER (a) D.C. BZ1 (a, b) (b) A.C. BZ1 (a, b)

10

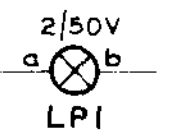
BUZZER, DETAILED FORM



OTHER REFERENCES – 2·7·3

11 — 42

LAMP



USE G.P.O. RATE BOOK DESCRIPTION, (MODIFIED) e.g., 2/50V COLOUR INDICATED IF REQUIRED.

POWER, MOTORS, GENERATORS, ETC.,

1 [1]

DIRECT CURRENT — D.C. or —

IF SYMBOL — IS NOT SUITABLE e.g., WHERE IT MAY BE CONFUSED WITH MINUS SIGN USE ====

2 [2]

ALTERNATING CURRENT — A.C. or ~ or $\sim_{50}$

NUMERALS INDICATE FREQUENCY

3

D.C. GENERATOR

4

A.C. GENERATOR

5

VOICE FREQUENCY GENERATOR

6

D.C. MOTOR

7

A.C. MOTOR

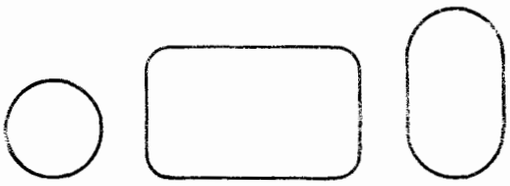
8 [11-1]

FRAME OR CHASSIS

VALVE COMPONENTS & EXAMPLES OF USE

*1 [74]

VACUUM OR
GAS FILLED ENVELOPE

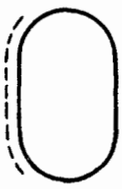


NOTES:-

(a) WHEN THE ENVELOPE IS GAS FILLED A LARGE SPOT IS INSERTED AS SHOWN. THIS IS USED FOR OTHER COMPONENTS IN ADDITION TO VALVES, e.g., BALLAST RESISTOR (SEE ITEMS 1·11·5 & 6) THE CHEMICAL SYMBOL OF THE GAS MAY BE SHOWN ADJACENT TO THE ENVELOPE.

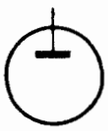
(b) INTERNAL CONDUCTING COATING (IF DESIRED)

(c) EXTERNAL METALLISED SCREEN COATING



2 [75]

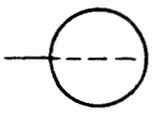
ANODE



SEE NOTES p. 1·29

3 [76]

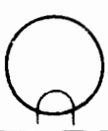
GRID



SEE NOTES p 1·29

4 [78]

FILAMENT OR DIRECTLY HEATED CATHODE OR HEATER



SEE NOTES p·1·29

5 [79·1]

CATHODE

SEE NOTES p.1·29

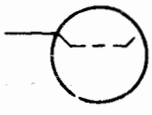
6 [79·2]

INDIRECTLY HEATED CATHODE

SEE NOTES p.1·29

7 [77]

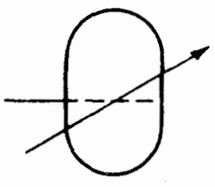
SCREEN GRID



SEE NOTES p.1·29

8

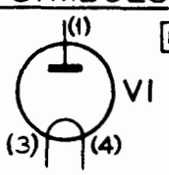
VARIABLE MUTUAL CONDUCTANCE



SEE NOTES p.1·29

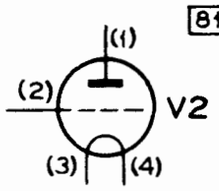
9. EXAMPLES OF USE OF SYMBOLS

(a) DIODE
(SYMBOLS 1,2 & 4) [80]

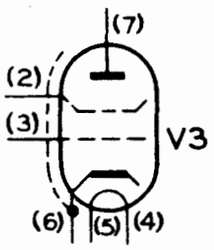


(b) TRIODE, DIRECTLY HEATED
(SYMBOLS 1,2,3 & 4) [81·1]

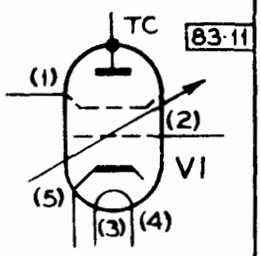
NOTE:-
IF INDIRECTLY HEATED SUBSTITUTE SYMBOL 6 FOR SYMBOL 4.



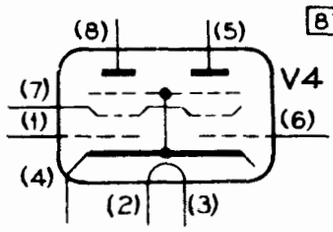
(c) SCREEN GRID WITH METALLISED SCREEN ENVELOPE, INDIRECTLY HEATED
(SYMBOLS 1c,2,3,6 & 7)



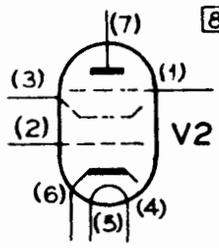
(d) SCREEN GRID WITH VARIABLE MUTUAL CONDUCTANCE, INDIRECTLY HEATED
(SYMBOLS 1,2,3,6,7 & 8)
SEE NOTES ITEM 1·29·1(e) [83·11]



(e) DOUBLE PENTODE, INDIRECTLY HEATED
(SYMBOLS 1,2,3,6 & 7) [87]

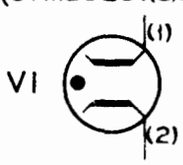


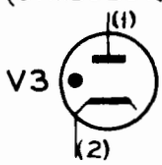
(f) PENTODE, INDIRECTLY HEATED
(SYMBOLS 1,2,3,6 & 7) [84]



[91 & 91·1]

(g) GAS FILLED DISCHARGE TUBE
(a) SYMMETRICAL (SYMBOLS 1(a) & 5) (b) ASYMMETRICAL (SYMBOLS 1(a), 2 & 5)





VALVE COMPONENTS

EXAMPLES OF USE

(CONTINUED)

SHOWING TYPICAL DESIGNATIONS & PIN NUMBERING

1. VALVES - GENERAL NOTES

(a) Symbols for multi-electrode valves can be built up by combining the symbols for the component parts.

(b) Connexions to the electrodes may be shown on either side of the envelope.

(c) Except for filaments or heaters, connexions shall not be shown at both ends of the same electrode.

(d) All electrodes, shields, heaters etc., having external connexions and all connexions to each electrode shall be shown, except where omission would lead to greater clarity.

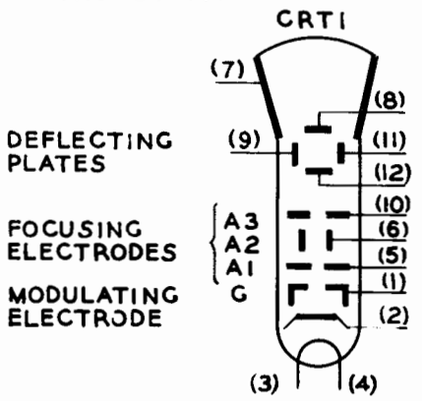
(e) Connexions made to electrodes otherwise than through the base of the valve may be indicated by a dot. (See item 1.28.9d).

2

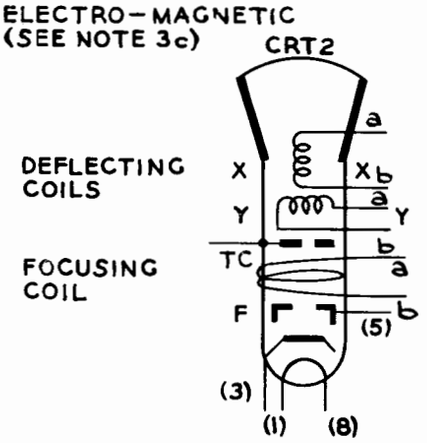
92·1 & 92·2

CATHODE-RAY TUBE

(a) ELECTRO-STATIC



(b) ELECTRO-MAGNETIC (SEE NOTE 3c)



3. CATHODE-RAY TUBE. NOTES

(a) Unless otherwise specified, the following convention will apply to the designation of cathode-ray deflector plates:-

With the tube held with it's axis of symmetry horizontal and with the base locating key uppermost, the X-axis is horizontal and the Y-axis vertical. Looking at the screen in the opposite direction to the electron stream XI is on the left, X2 on the right, Y1 is at the top and Y2 at the bottom.

Thus under stated conditions, positive potentials on the X1 and Y1 plates will deflect the spot to the left and upwards.

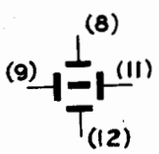
Further, the X plates in general will be nearer the screen and the Y plates nearer the "gun."

(b) In view of the fact that the tube may be mounted in a position other than that defined above, the deflector plate system in circuit diagrams should be drawn so as to represent graphically the system as seen by the observer.

Thus a positive potential applied to the plate drawn on top in the diagram will deflect the spot upwards or away from the observer.

(c) Similarly, in circuit diagrams where the deflector coil system is used, the system should be drawn so that a current in the coil with its axis horizontal will deflect the spot upward or downward.

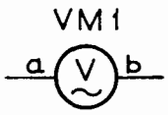
(d) With double beam tubes the deflector plate system is drawn thus :-



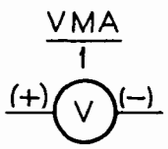
ELECTRICAL MEASURING INSTRUMENTS.

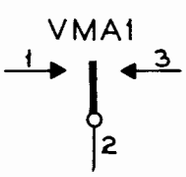
*1
VOLTMETER

(a) WITHOUT CONTACTS



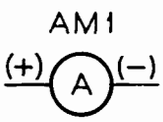
(b) WITH CONTACTS



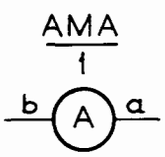


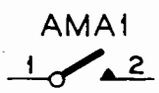
*2
AMMETER

(a) WITHOUT CONTACTS

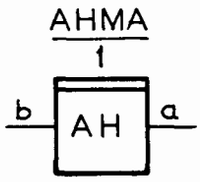


(b) WITH CONTACTS





3
AMP/HOUR METER



4

SPARE

CONDUCTORS & CONNEXIONS

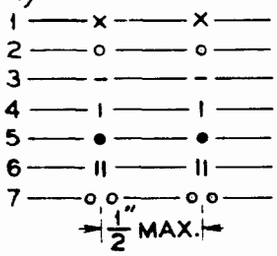
*1 — 4

CONDUCTOR

THE THICKNESS OF A LINE MAY BE VARIED: FOR EXAMPLES SEE SPECIMEN DIAGRAMS.

2 — 5

ALTERNATIVE CONNEXIONS (PRIORITY AS SHOWN)



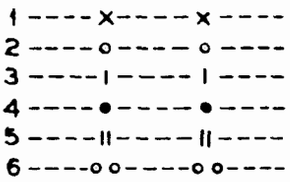
OTHER REFERENCES – 8·1·3

3 — 6

JUMPER

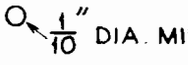
4

ALTERNATIVE JUMPERS (PRIORITY AS SHOWN)



5

TAG OR TERMINAL

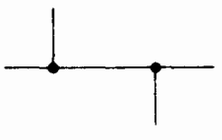


6 — 4·1

CROSSING OF CONDUCTORS NOT IN CONTACT

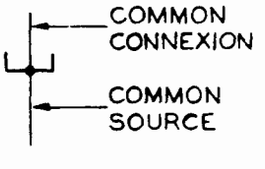
7 — 4·2

TAPPINGS (SEPARATE POINT FOR EACH TAPPING)



*8 — 4·21

COMMON CONNEXIONS TO GROUPED APPARATUS



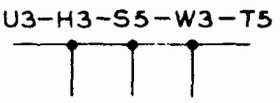
9

WIRING DATA INDICATED ON SCHEMATIC

(a)

FOR WIRING BETWEEN THREE TAGS "L" INDICATES LOOP WIRE, THE SYMBOL TO BE DRAWN CLOSE TO THE TEE CONNEXION. U POINTS WILL BE SHOWN ON A SHORT SPUR WHERE NECESSARY TO AVOID AMBIGUITY.

(b)

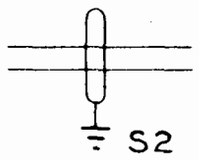


FOR WIRING BETWEEN FOUR OR MORE TAGS POINT TO POINT WIRING WILL BE GIVEN.

10 — 24

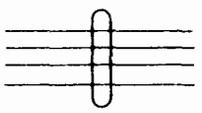
SCREENED CONDUCTORS

THE WIRING POINT BELOW THE EARTH INDICATES THE POINT TO WHICH THE SCREEN IS CONNECTED ON JACKED-IN UNITS ONLY.
THE SHEATH SHALL NOT BE INCLUDED IN THE EARTH RUN.

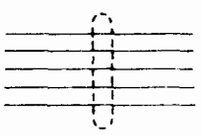


11 — 4·4

CABLE



ALTERNATIVE WHEN USE OF CABLE OR WIRE IS PERMITTED.

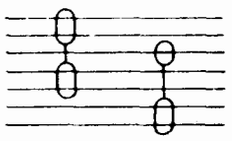


NOTE:–
UNLESS OTHERWISE SPECIFIED ON DIAGRAM ALL WIRING ENCLOSED IN CABLE SIGN IS 23 S.W.G.

OTHER REFERENCES – 4·2·14

12

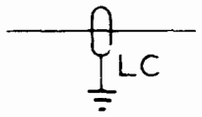
TWO CABLES (WHERE IT IS INCONVENIENT TO SEPARATE WIRING ON DIAGRAMS INTO TWO GROUPS). SEE NOTE 11.



OTHER REFERENCES – 4·2·14

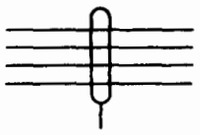
13

LEAD COVERED SINGLE (SHEATH EARTHED)



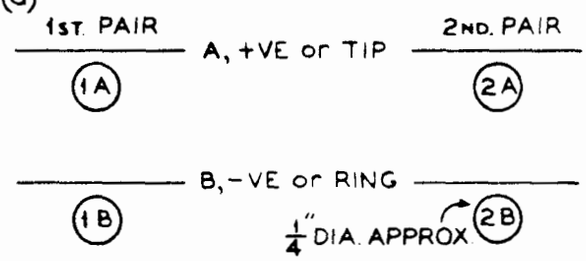
CONDUCTORS & CONNEXIONS (CONTINUED)

1
CORD
(NUMBER OF CONDUCTORS TYPICAL ONLY)



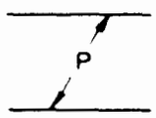
*2 SWITCHBOARD CABLE OR WIRE PAIRS

(a)



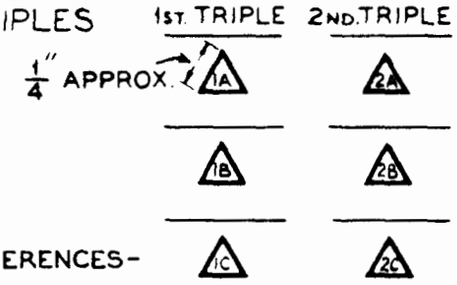
EXCEPT ON SHELF JACK AND CROSS CONNEXION DIAGRAMS ON WHICH:−

(b)



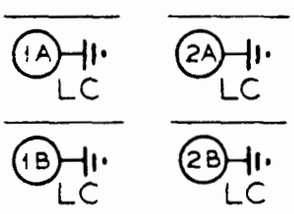
SHALL BE USED FOR TWISTED PAIRS
OTHER REFERENCES − 5·2·16

3
SWITCHBOARD WIRE TRIPLES

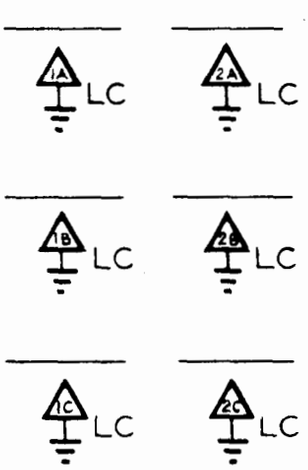


OTHER REFERENCES − 5·2·16

4
LEAD COVERED PAIRS
(SHEATH EARTHED)

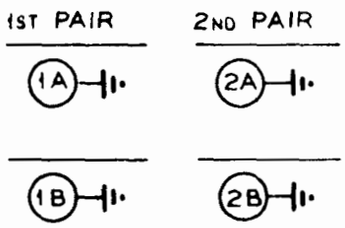


5
LEAD COVERED TRIPLES
(SHEATH EARTHED)



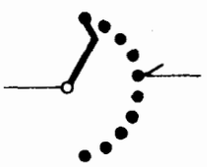
*6. DELETED

7
SCREENED WIRE PAIRS
(SCREEN EARTHED)

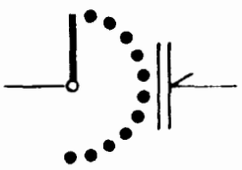


8
BANK & JACK MULTIPLES CONNEXIONS

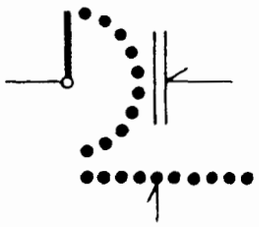
(a) UNISELECTOR



(b) TWO MOTION SELECTOR WITHOUT 11TH CONTACTS WIRED.



(c) TWO MOTION SELECTOR WITH 11TH CONTACTS WIRED



(d) SWITCHBOARD JACK

9
(a) STRIP CONNEXION

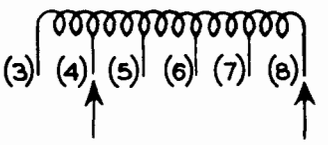
(b) "GHOST" STRIP CONNEXION

OTHER REFERENCES − 9·1·3 & 4

CONDUCTORS & CONNEXIONS (CONTINUED)

1
VARIABLE
CONNEXION

EXAMPLE OF USE



NOTE:-
VARIABLE TAP TO BE SHOWN
CONNECTED TO NORMAL CONNEXION.

SWITCHES

*1. RENUMBERED 1·35·7

*2. INCLUDED IN 1·35·5

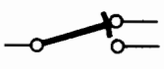
*3 RENUMBERED 1·35·8

31

*4.
COMPONENTS

(a) CONTACT 

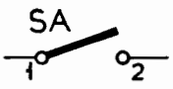
(b) NON-BRIDGING ARM OR WIPER 

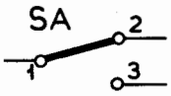
(c) BRIDGING ARM OR WIPER 

NOTE:- ACTION OF OTHER TYPES OF ARM OR WIPER TO BE COVERED BY A NOTE ON DIAGRAM.
RADIUS OF CONTACT ARC MAY BE INCREASED IF REQUIRED BY COMPLEXITY OF WIRING.

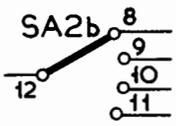
31, 31·1, 31·11

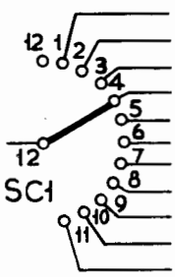
*5.
EXAMPLES OF USE OF COMPONENTS

(a) SINGLE WAY 

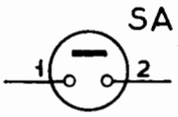
(b) 2 WAY 

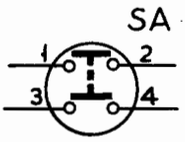
(c) MULTI-WAY ROTARY

(i) WIPER CONTACT NOT SWEPT BY WIPER 

(ii) WIPER CONTACT SWEPT BY WIPER 

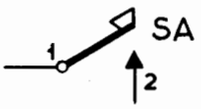
6
TUMBLER

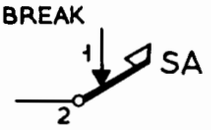
(a) SINGLE-POLE 

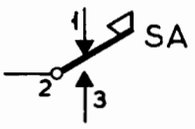
(b) DOUBLE-POLE 

30·1, 30·2, 30·3, 30·4.

*7.
PRESS BUTTON

(a) MAKE 

(b) BREAK 

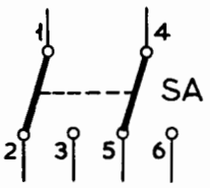
(c) CHANGE-OVER 

(d) MAKE BEFORE BREAK 

31·2

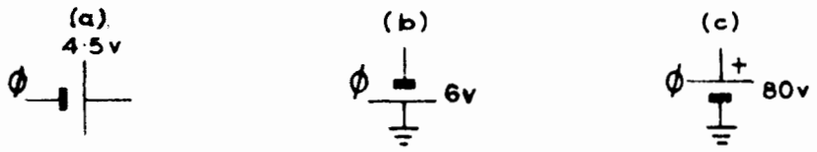
*8.
MULTI-POLE

EXAMPLE:-

DOUBLE-POLE TWO-WAY 

COMMON SERVICES

1
BATTERY OR EQUIVALENT POWER SUPPLY
(DIRECT OR VIA FUSE AND/OR TERMINAL ONLY)

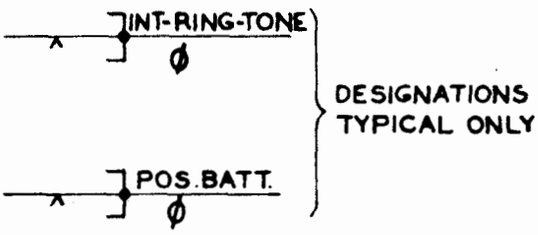


VOLTAGE VALUE SHALL BE SHOWN ONLY WHEN IT DIFFERS FROM THAT IN THE TITLE BOX OF THE ROUTED SCHEMATIC DIAGRAM.
THE ϕ SIGN SHALL BE SHOWN ONLY WHEN IT IS NECESSARY TO REFER TO A RACK COMMON SERVICE DIAGRAM FOR WIRING INFORMATION
NEGATIVE SIGN MAY BE SHOWN WHEN NECESSARY.

2
EARTH
(DIRECT)

THE ϕ SIGN SHALL BE SHOWN ONLY WHEN IT IS NECESSARY TO REFER TO A RACK COMMON SERVICES DIAGRAM FOR WIRING INFORMATION.

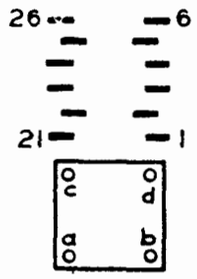
3
ALL OTHER COMMON SERVICES
(INCLUDING BATTERIES FED THROUGH GUARDING EQUIPMENT)



RELAYS

AS SEEN FROM REAR

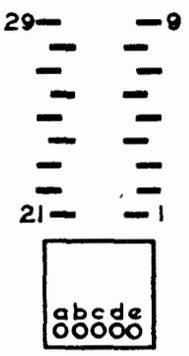
1 600 TYPE



LEVER SPRING TAGS ARE THOSE NEAREST CENTRE LINE

STAGGERING OF TAGS TYPICAL ONLY

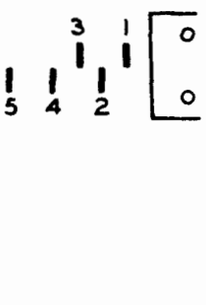
2 3000 TYPE



LEVER SPRING TAGS ARE THOSE NEAREST CENTRE LINE

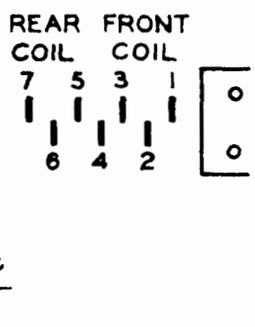
STAGGERING OF TAGS TYPICAL ONLY

* 3 HIGH SPEED P.O. STANDARD SINGLE COIL



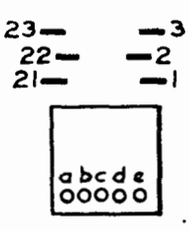
1 IS INNER (START) END OF WINDING.

4 HIGH SPEED P.O. STANDARD DOUBLE COIL



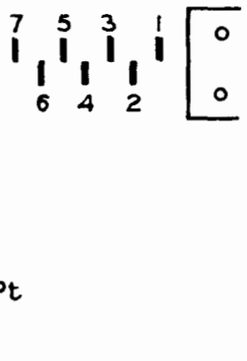
1 & 7 ARE INNER (START) ENDS OF WINDINGS

5 HIGH SPEED WITH TWO CHANGE-OVERS



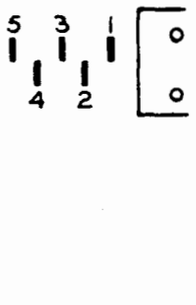
NOTE:-
a & e ARE INNER (START) ENDS OF WINDINGS

6 HIGH SPEED P.O. STANDARD SINGLE COIL WITH TAPPING



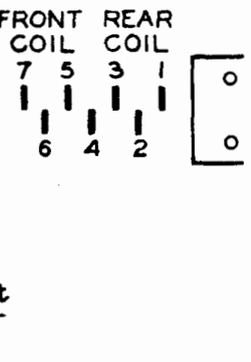
1 IS INNER (START) END OF WINDING.

* 7 HIGH SPEED SIEMENS TYPE SINGLE COIL (SUPERSEDED BY ITEM 3)



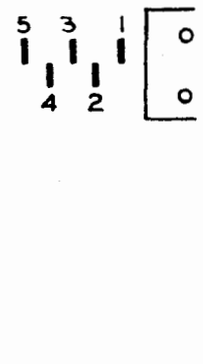
4 IS INNER (START) END OF WINDING.

8 HIGH SPEED SIEMENS TYPE DOUBLE COIL (SUPERSEDED BY ITEM 4)



1 & 7 ARE INNER (START) ENDS OF WINDINGS.

9 HIGH SPEED SIEMENS TYPE SINGLE COIL WITH TAPPING (SUPERSEDED BY ITEM 6)



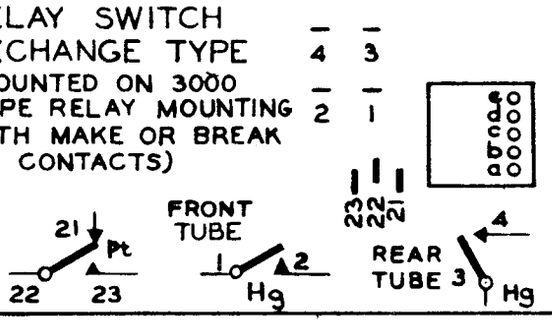
2 IS INNER (START) END OF WINDING.

RELAYS (CONTINUED)

AS SEEN FROM REAR

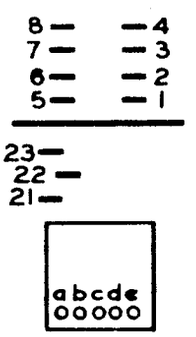
1 RELAY SWITCH EXCHANGE TYPE

(MOUNTED ON 3000 TYPE RELAY MOUNTING WITH MAKE OR BREAK Hg CONTACTS)

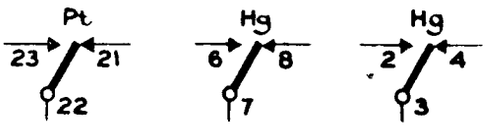


2 RELAY SWITCH MAINS TYPE

(WITH CHANGE OVER Hg CONTACTS)

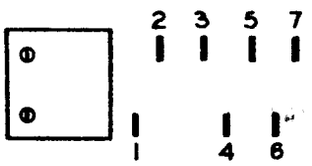


TYPICAL CONTACTS

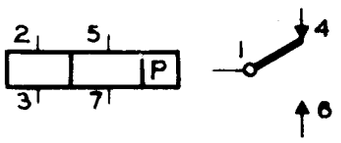


NOTE:- TERMINALS 1 & 5 ARE SPARE.

3 POLARISED WITH TWO WINDINGS S.T.C. TYPE P.O. Nº 328B.

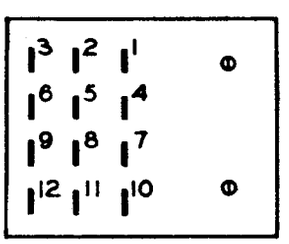


TAG 1 IS CONNECTED TO FRAME OF RELAY

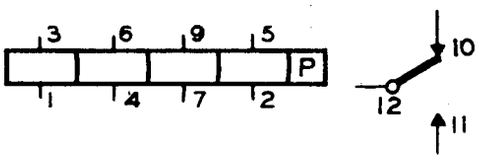


*4 CARPENTER POLARISED

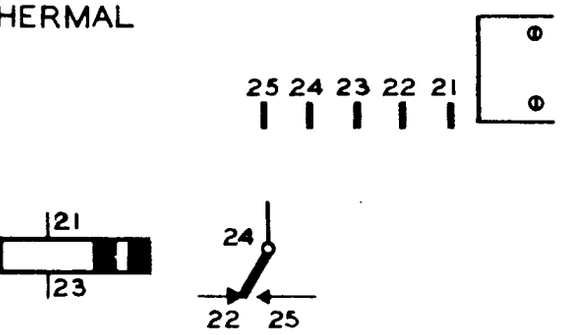
P.O. No. 2B/---
" " 3B/---



NUMBER OF COILS TYPICAL



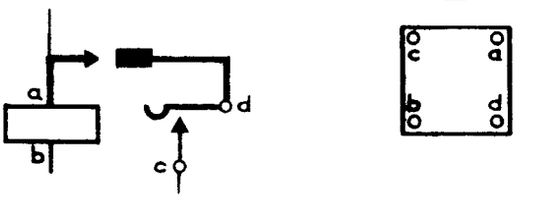
*5 THERMAL



NOTE:- CAN BE MOUNTED IN PLACE OF LEFT HAND (FROM REAR) SPRING SET ON 3000 TYPE RELAY.

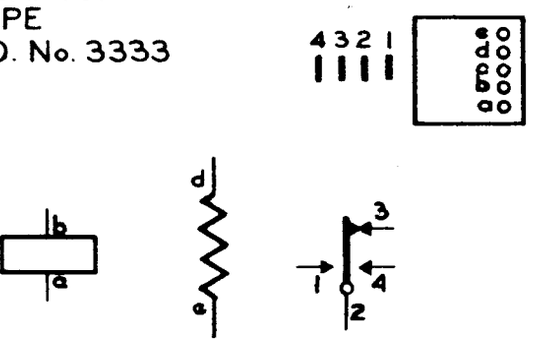
6 10 STEP

INTERNALLY CONNECTED



7 100 TYPE METER

8 VIBRATOR TYPE P.O. No. 3333



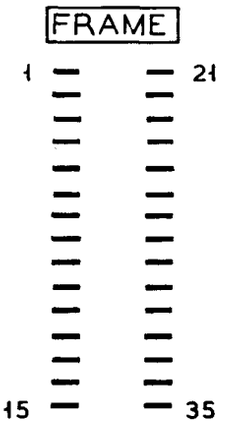
LAYOUTS

KEYS

AS SEEN FROM REAR

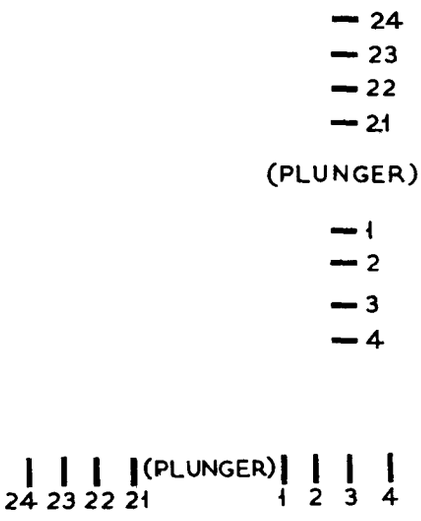
*1.
LEVER TYPE

SINGLE THROW OR DOUBLE THROW



TIP OR + TO BE WIRED TO SPRINGS 21–35 & RING OR – TO SPRINGS 1–15. DRAWING SD 22 SHOWS NUMBERING OF P.O. CODED KEYS.

*2
PLUNGER TYPE



FOR SINGLE SIDED KEYS SPRINGS 21 ETC., ARE NOT FITTED.

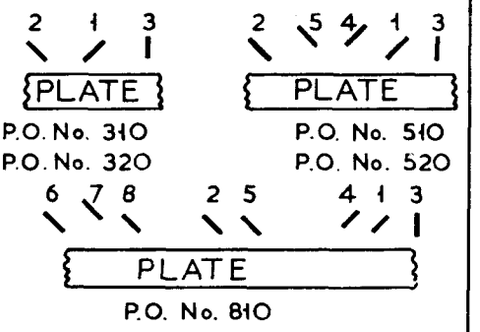
3.

JACKS SWITCHBOARD TYPE

AS SEEN FROM REAR
(FOR OTHER JACKS SEE P. 2·9)

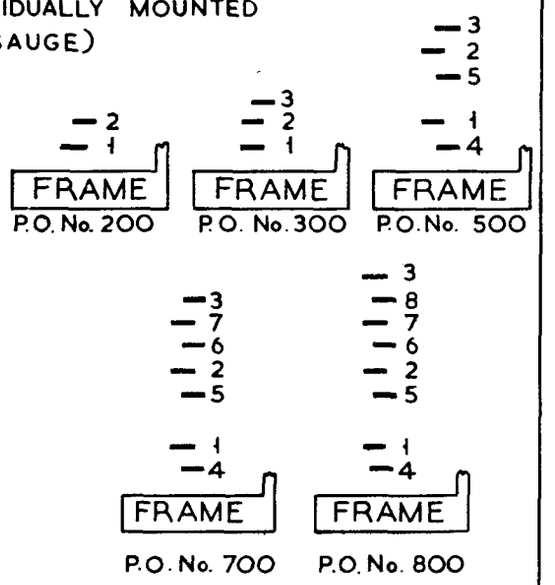
*4.

STRIP MOUNTED (B GAUGE)



*5

INDIVIDUALLY MOUNTED
(B GAUGE)



*6. TRANSFERRED TO 2·9·2

*7. TRANSFERRED TO 2·9·3

8.

MECHANICALLY OPERATED SPRINGSETS LAYOUT

1. TWO MOTION SELECTOR - CHANNEL TYPE

NO UNIFORM ARRANGEMENT OF SPRINGSETS EXISTS AND THEREFORE NO LAYOUT IS GIVEN.

NOTES:-

(a) Where two similar contact units appear in the same spring set platinum contacts (if required) are first in the order of numbering.

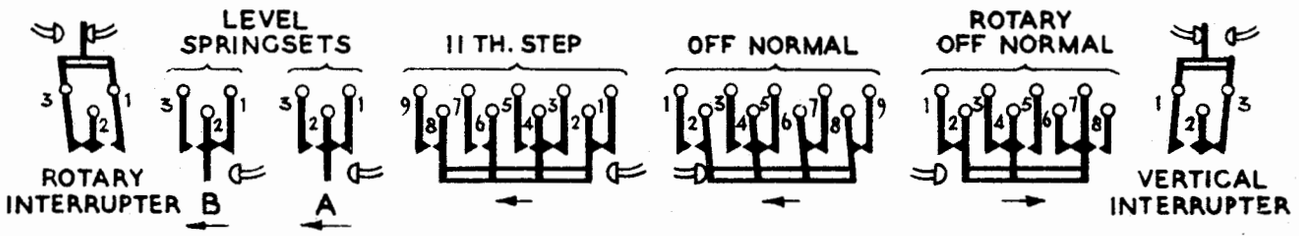
(b) Full battery shall never be connected to the outer spring of any spring set.

(c) Sequence of contact units from operating lever is B^S, C^S, M^S, J^S & K^S. The "N" spring set being normally operated functions as M^S, C^S, B^S, J^S & K^S.

On selectors manufacturered by Messrs. Ericsson & S.T.C. the "NR" spring sets and on those manufactured by Messrs. Siemens the "NR" & "Z" spring sets are also normally operated and the functional sequence of contact units from the operating lever is K^S, J^S, M^S, C^S & B^S. The springs are numbered in the direction of travel, i.e. spring 1 is remote from the operating lever.

(d) For designation see p.8.5. For maximum number of springs per assembly see p.2.5.

2. TWO MOTION SELECTOR - 2000 TYPE WITH TYPE 1 SPRINGSETS



TYPICAL SPRINGSETS WITH SELECTOR IN THE NORMAL (UNSEIZED) CONDITION. TAG POSITIONS AS SEEN FROM THE REAR.

NOTES.

(a) Order of contact units of any springset: B^S, C^S and M^S from the operating lever. The "N" springset being normally operated, functions as M^S, C^S & B^S.

(b) If a "K" unit is required, this shall be obtained by a special adjustment of the "C" unit.

(c) Where two similar contact units appear in the same springset, platinum contacts (if required) are first in order of numbering.

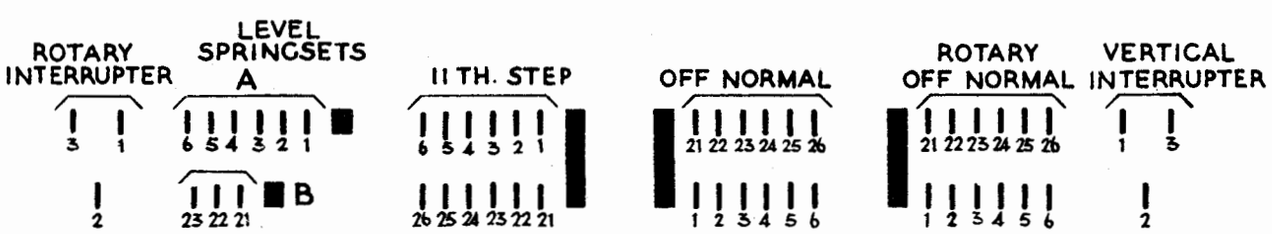
(d) Full battery shall never be connected to the outer spring of any springset.

(e) N R Springset operates on the 1st. rotary step and restores on leaving the 11th contact.

(f) For designation see p.8.5. For maximum number of springs per assembly see p.2.5.

3. TWO MOTION SELECTOR - 2000 TYPE WITH TYPE 2 SPRINGSETS

LAYOUT OF WIRING TAGS AS SEEN FROM REAR



•N SPRINGS ARE OPERATED WHEN THE SELECTOR IS IN THE NORMAL (UNSEIZED) CONDITION.

NOTES:-

(a) Starting from spring number one and continuing through the second springset when fitted, the order of the contact units is M^S, B^S and C^S.

(b) The Vertical and Rotary Interrupters are toggle operated as in 2 above.

(c) Where practicable, Battery and Earth should not be connected to adjacent springs.

(d) When a break combination is fitted to the vertical or rotary interrupter, the lower (and inner) tag is numbered 1 and the upper (and outer) tag is numbered 2.

MECHANICALLY OPERATED SPRING SETS

Maximum Capacities and Functions

Two Motion Selector - Channel Type

Function of Assembly		Maximum Number of Springs	Remarks
1 Vertical off normal springs	(N)	8	
2 Rotary off normal springs	(NR)	3 Contact units	
3 11th. Step springs	(S)	9	Less "NR" springs when required. "S" springs and auxiliary screw arc cannot be used simultaneously.
4 Release magnet springs	(Z)	4	
5 Vertical detent springs	(DD)	3	Cannot be used simultaneously with "Z" springs.
6 Vertical magnet springs	(VM)	2	
7 Rotary magnet springs	(RM)	4	If "RM" has 4 springs a left hand test jack cannot be fitted.
8 Normal post springs	(NP)	4	
9 Rotary release magnet springs	(RZ)	2	
10 NOTE:- The maximum capacities for spring sets, shown in the Table, are those that apply to selectors made by all Manufacturers. The same maximum capacities do not always apply to selectors made by only one Manufacturer. It does not follow that the maxima can be used simultaneously in a number of spring sets on the same selector.			

Two Motion Selector - 2000 Type with Type 1 Spring sets.

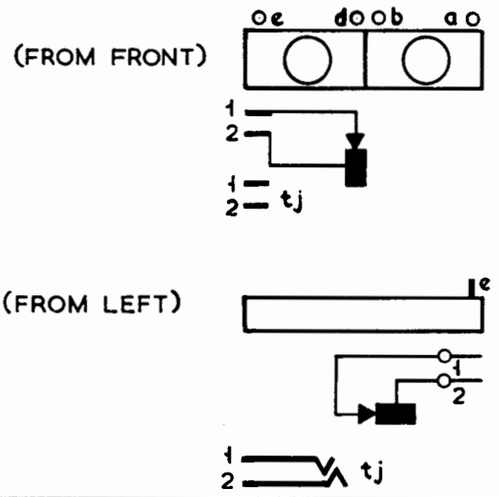
Function of Spring set		Maximum number of springs
11 Vertical interrupter springset	(VM)	3
12 Rotary off normal springset when vertical interrupter springset is fitted	(NR)	8
13 Rotary off normal springset when vertical interrupter springset is not fitted.	(NR)	12
14 Off normal springset	(N)	9 (3 change overs cannot be fitted)
15 11th. Step springset when level springset is fitted in NPA position.	(S)	9
16 11th. Step springset with no level springset fitted in NPA position	(S)	12
17 Level springset	(NP)	6
18 Level springset when two level springsets are fitted	(NPA) & (NPB)	3 3
19 Rotary interrupter springset	(RM)	3

Two Motion Selector - 2000 Type with Type 2 Springsets.

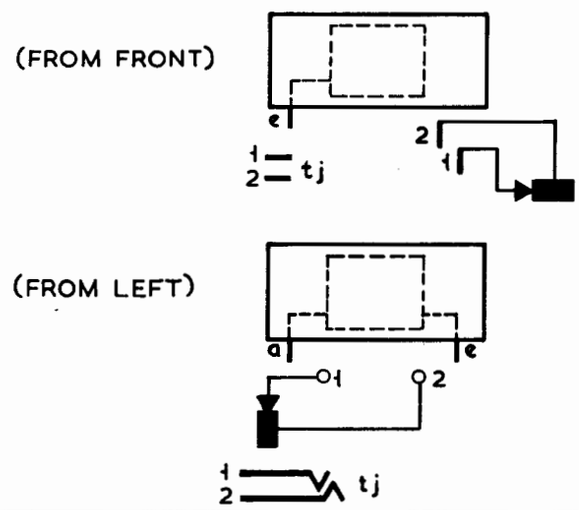
Spring Set		Maximum Number of Springs	Arrangement of Contact Units in Spring Assemblies		
20 Vertical Interrupter Rotary Interrupter.	(VM) (RM)	3 springs each (Non relay type)	Total Number of contact units in Assembly (N, NR or S)	Number of contact units in springset numbered 1-6	Number of contact units in springset numbered 21-26
21 Rotary OFF Normal OFF normal 11th step	(NR) (N) (S)	12 springs each (5 contact units)	1	1	-
22 Level springs (one set only)	(NP)	3 springs in NPB posn. or 6 springs, in NPA posn. (2 contact units)	2	2	-
			3	2	1
			4	2	2
			5	3	2
23 Level springs (Two sets)	(NPA) & (NPB)	6 springs (excluding bias spring of a single break contact) 3 contact units, of these not more than 3 springs (1 contact unit) may be fitted in NPB position.	Where two similar contact units appear in the same springset assembly, platinum contacts, when used, are first in the order of numbering.		

SELECTORS

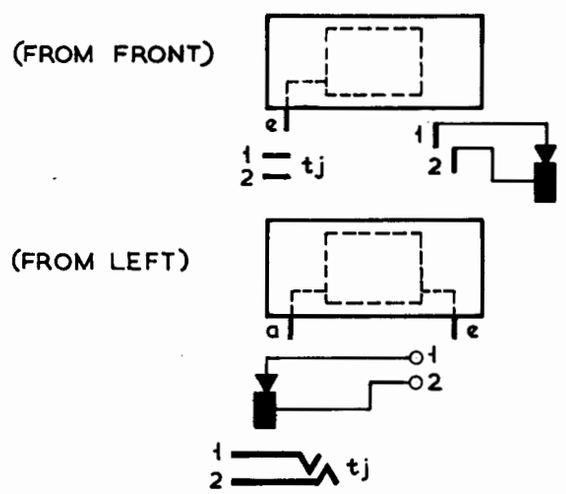
1. UNISELECTOR – TYPE 1.



2. UNISELECTOR – TYPE 2 (SINGLE COIL)



3. UNISELECTOR – TYPE 3 (SINGLE COIL)

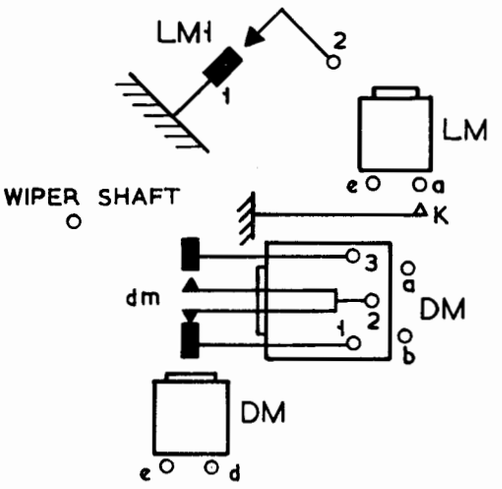


4.

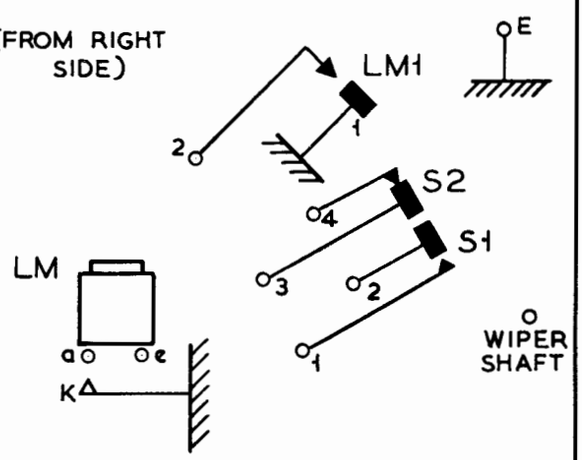
NOTE:- THE MECHANISM OF TYPES 2 & 3 ARE INTERCHANGEABLE WITH THAT OF TYPE 1. WHEN INSTALLED AS MAINTENANCE REPLACEMENT, COIL TAGS 'a' & 'e' SHALL BE WIRED AS FOR 'b' & 'e' RESPECTIVELY, AS INDICATED ON EXISTING WIRING DIAGRAMS.

5. MOTOR UNISELECTOR

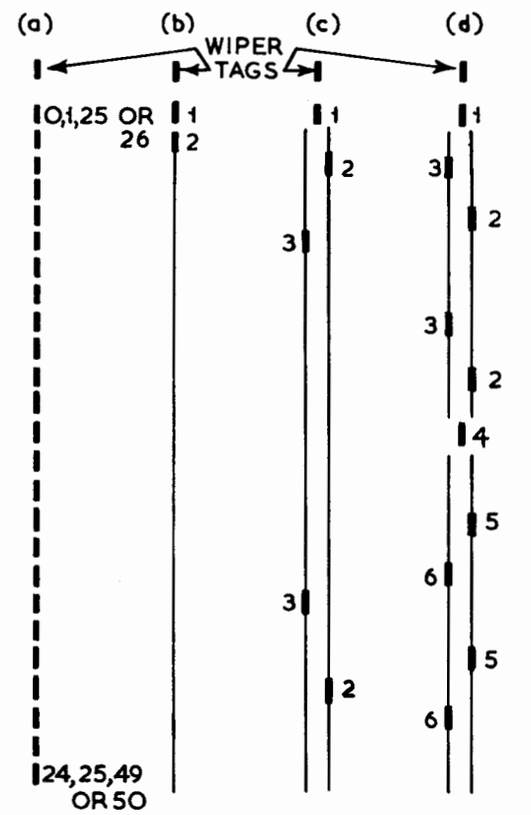
(a) (FROM LEFT SIDE)



(b) (FROM RIGHT SIDE)



*6. UNISELECTOR – TYPE 1, 2 & 3 BANK TAGS (REAR VIEWS)



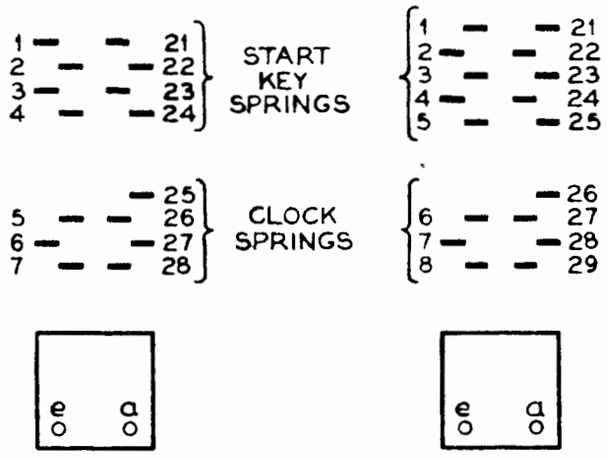
(a) 25 POINT ARC.
(b) HOMING ARC WITH SOLID METAL SEGMENT.
(c) " " " DOUBLE " "
(d) " " " SECOND HOME POSITION.

MISCELLANEOUS APPARATUS

1. CLOCK 44. AS SEEN FROM REAR.

(a) WITH TWO POSITION START KEY

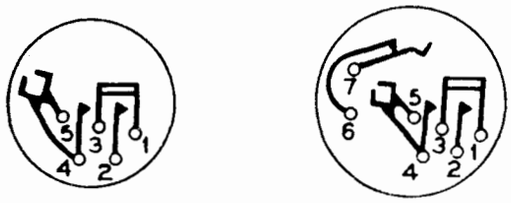
(b) WITH THREE POSITION (UNIVERSAL)



2. DIAL. AS SEEN FROM REAR

(a) WITHOUT AUXILIARY SPRINGS

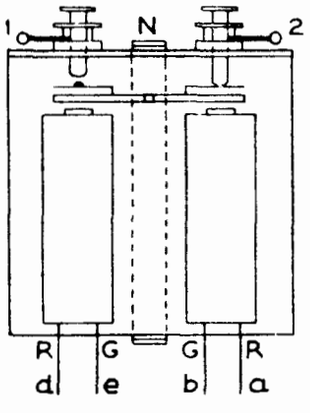
(b) WITH AUXILIARY SPRINGS



(c) TRIGGER

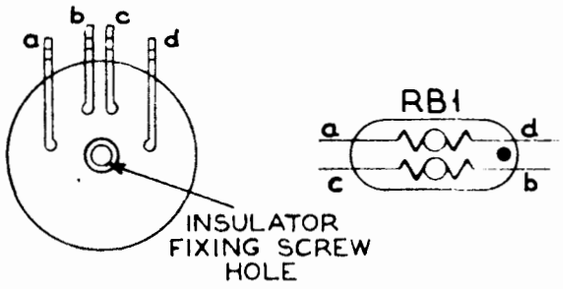
3. BUZZER No. 23A.

UNMOUNTED.



*4. RESISTOR BARRETTER No 1.

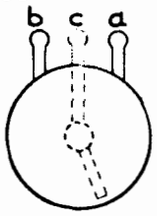
VIEW OF BASE FROM BELOW WITH INSULATOR REMOVED.



*5. RESISTOR VARIABLE

POTENTIOMETER Nos. 26 & 30

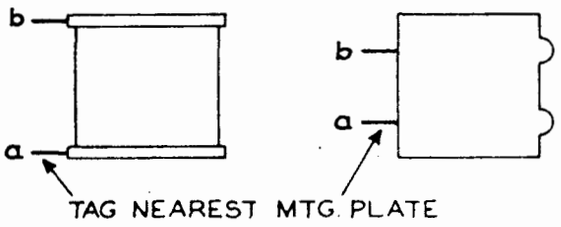
AS SEEN FROM REAR



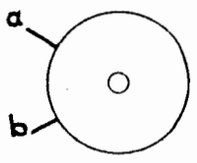
6. RESISTOR COILS

(a) P.O. No. 9.

(b) P.O. No. 25



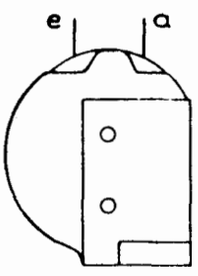
(c) PO Nos. 12 & 15 (VIEWED FROM TAG END OF COIL)



7. TWO MOTION SELECTOR

2000 TYPE

VERTICAL OR ROTARY MAGNET.

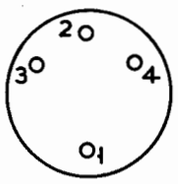


(VIEWED FROM TAG END OF COIL)

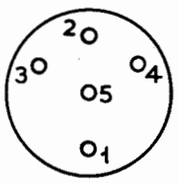
MISCELLANEOUS APPARATUS
(CONTINUED)

*1. VALVE HOLDERS

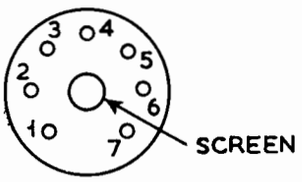
(a) BRITISH 4 PIN



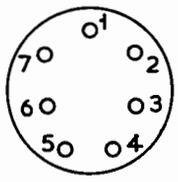
(b) BRITISH 5 PIN



(c) B7G

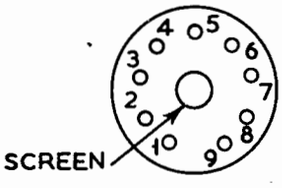


(d) BRITISH 7 PIN



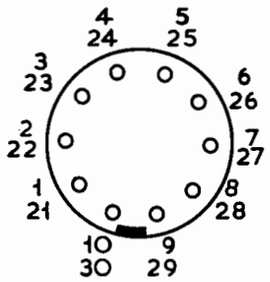
(e) INTERNATIONAL OCTAL
MAZDA OCTAL

(f) B9A



(VIEWED FROM REAR OF VALVE HOLDER)

(g) VALVEHOLDER No. 35 AND ADAPTOR D 90021 (AUXILIARY TAG RING)



(VIEWED FROM TOP OF VALVEHOLDER)

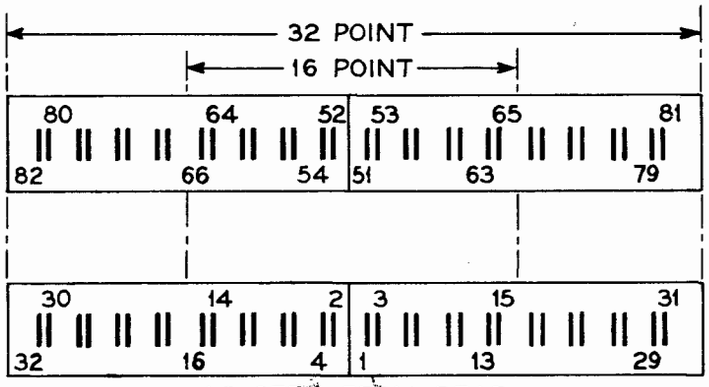
THE HIGHER NUMBER IN EACH PAIR REFERS TO THE TAG ON THE ADAPTOR CORRESPONDING TO THE TAG ON THE VALVEHOLDER BEARING THE LOWER NUMBER

MISCELLANEOUS APPARATUS
(CONTINUED)

JACKS (FOR SWITCHBOARD TYPE SEE P. 2·3)

1.
SHELF

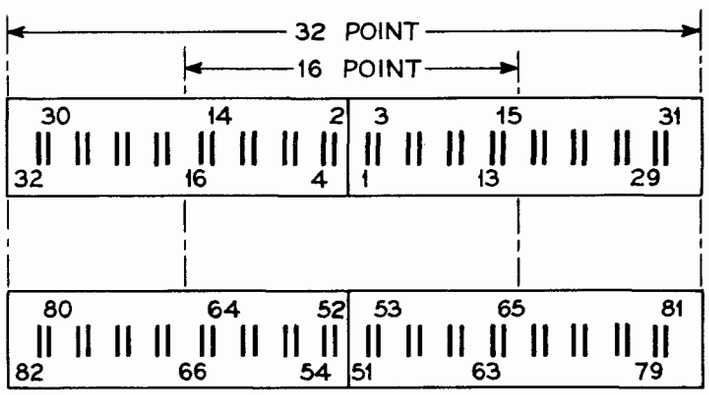
(a) 2000 TYPE SELECTOR



AS SEEN FROM REAR

(b) PRE-2000 TYPE EQUIPMENT AND 2000 TYPE EQUIPMENT OTHER THAN SELECTORS

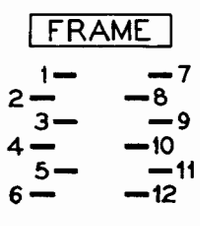
(i)



AS SEEN FROM REAR

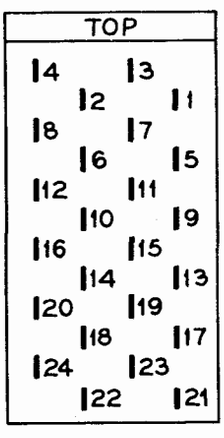
(ii) WHEN A THIRD SHELF JACK AND PLUG ARE PROVIDED ON 2000 TYPE EQUIPMENT THEY ARE FITTED IN THE LOWEST POSITION AND ARE NUMBERED 132 ← 102/101 → 131 AS SEEN FROM REAR.

2.
12 POINT
(AS USED FOR METER ROUTINE TEST)



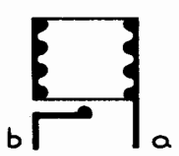
REAR VIEW

3.
24 POINT TEST
(P.O. No. 51)
(P.O. No. 58)



REAR VIEW

4.
LAMP, P.O. No. 45 (OR EQUIVALENT EDISON SCREW TYPE)



SECTIONAL VIEW

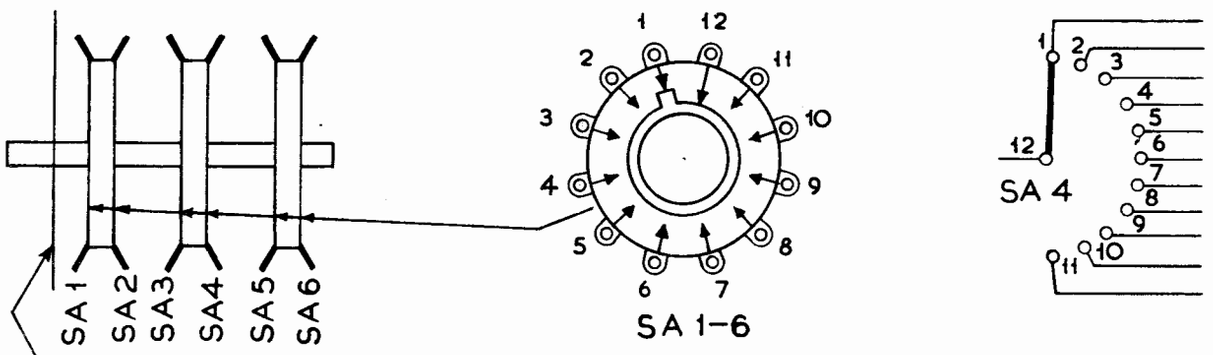
5.

MISCELLANEOUS APPARATUS
(CONTINUED)

1. ROTARY SWITCH (WAFER TYPE)

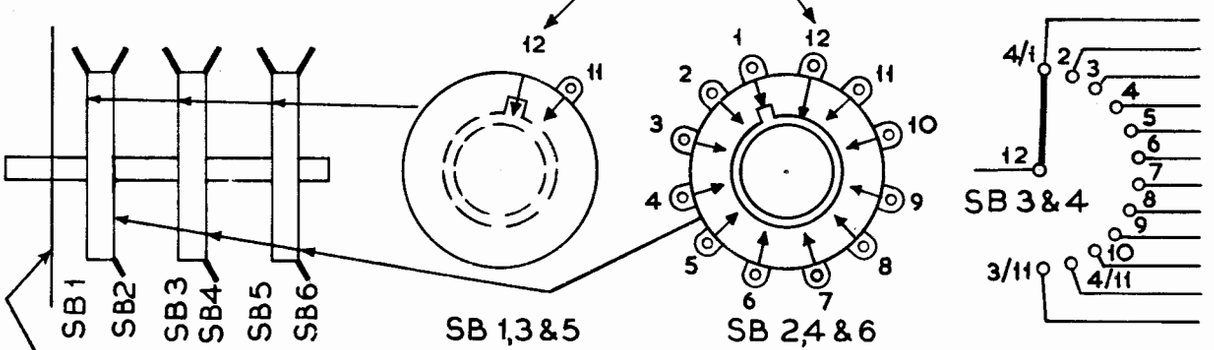
SIDE VIEWS REAR VIEWS SYMBOLS

(a) 3 WAFER 6 POLE 11 POSITION

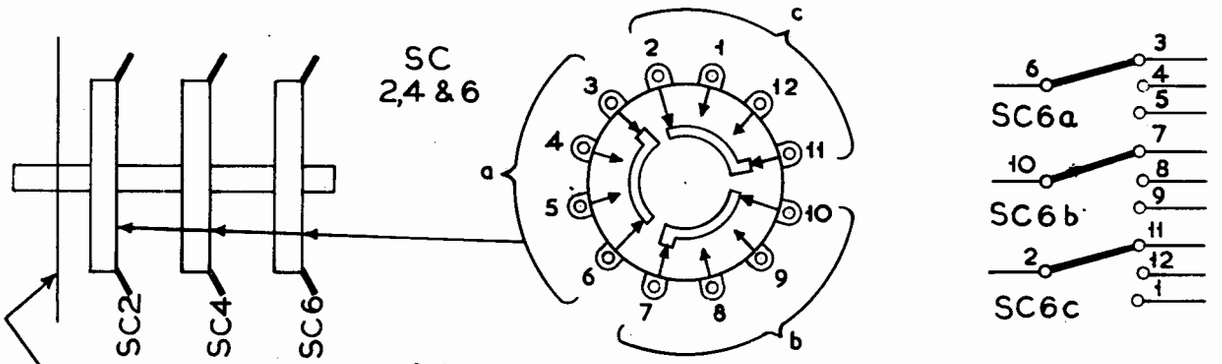


(b) 3 WAFER 3 POLE 12 POSITION

NO TAG. SB 1/12, 3/12 & 5/12 ARE INHERENTLY CONNECTED TO SB 2/12, 4/12 & 6/12 RESPECTIVELY

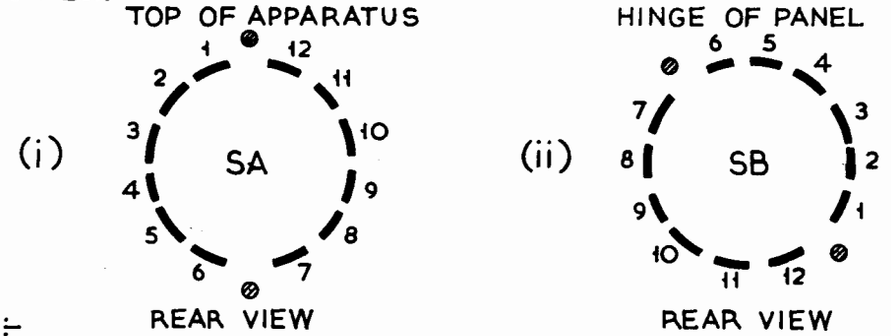


(c) 3 WAFER 9 POLE 3 POSITION



'a' IS THE FIRST COMPLETE GROUP STARTING ANTI-CLOCKWISE FROM CONTACT 1

(d) EXAMPLES OF LAYOUT SKETCHES USED ON DIAGRAMS TO INDICATE TAG NUMBERING IN RELATION TO MOUNTING POSITION OF SWITCH (SEE 5·3·20).



NOTE:-
THE POSITION OF THE LOCATING LUG OR ANY OTHER FEATURE WHICH MAY BE USED AS A REFERENCE POINT SHOULD BE SHOWN IN SKETCH.

COMPONENT DESIGNATIONS

1. Principles

Components are divided into two classes:-

(a) Class "a". Switches, relays and similar devices.

This class includes any device for discontinuously changing the configuration of an electrical circuit by mechanical movement.

(b) Class "b". All other components.

2. Rules

(a) Class "a" Components

These shall be designated by one or more letters e.g. JK (Jack).

Components with the same letter code shall be distinguished by the addition of upper case letters, e.g. JKB (the second jack).

Contact units and spring tags of contact units shall be numbered.

Coil tags shall be lettered (lower case) except that when the coil tags are in the same assembly as the springs they shall be numbered.

(b) Class "b" Components

These shall be designated by one or more letters, e.g., FS (fuse). Components with the same letter code shall be distinguished by the addition of numbers, e.g., FS3 (the third fuse).

Tags or terminals shall be lettered (lower case).

(c) Designation of pins and tags

The following departures from the above rules have been authorised.

(i) Engraved Components

Where tag or terminal designations are engraved on a component, the standard reference letter or number may be replaced on diagrams by the actual marking shown in brackets, e.g., C10(2). The brackets shall be omitted in wiring runs.

(ii) Valves

Tags of valve holders shall be numbered and the number shall be shown in brackets, e.g. V1(8). The brackets shall be omitted in wiring runs.

3. Application of the Rules

(a) The general application of component and tag designations is illustrated in the symbol and layout sections of this document.

(b) Designations on routed schematic diagrams shall follow those on the equivalent P.O. schematics or other basic documents, being amplified where necessary.

Details of the designations applicable to particular components are set out in tables 1 to 4.

(c) Where information given in the tables has been amplified by notes a reference is made in the table to the relevant item number under which the additional rules are to be found.

(d) Components with contact units shall be designated in the form of a fraction, of which the numerator is the component designation and the denominator the total number of contacts units, e.g. A. (The contact units are then designated A1 & A2).

4. TABLE I - GENERAL

Component	Designation	See Item
Bell	BL1, BL2, etc.	
Buzzer	BZ1, BZ2, "	
Capacitor	C1, C2, " (Note 1)	3.6.8 (a)
Cathode Ray Tube	CRT1, CRT2 "	3.6.8 (b)
Chargeable Time Clock	CTC	
Dial, Automatic	ADA, ADB, etc.	
Element, Symmetrical, with non-linear current/voltage characteristic	RX1, RX2, etc.	
Fuse	FS1, FS2, "	3.6.8 (c) & 1.26.1
Generator, hand	HGA, HGB, "	
Heat Coil	HCA, HCB, "	
Howler	HR	
Inductor	L1, L2, etc. (Note 1)	3.6.8 (e)
Induction Coil, Oper's.	IC1, IC2, etc.,	3.6.8 (d)
Interrupter, Rotary	INT	
Jack, Isolation	TJA, TJB, etc.	
" , Operators & Swbd.	JKA, JKB, "	
" , Test, (Selector, Relay Set etc.)	TJ	3.6.8 (f)
Key	K followed by single or two letter functional code	3.6.8 (g)
Lamp	LP1, LP2, etc.	
Link (U or Wire)	LKA, LKB, "	
Meter	M prefixed by functional code	
* Microphone	MIC.1, MIC2, etc.	
Receiver	TL1, TL2, "	
Rectifier (Metal)	MR1, MR2, " (Note 1)	
Resistor	R1, R2, " (")	3.6.8 (h)
Resistor, Ballast	RB1, RB2, "	
* Resistor, Bulb or Lamp	RLP1, RLP2, "	
Resistor, Variable or Pre-set	RV1, RV2, "	
Strip, Connexion	SCA, SCB, "	
* Switch	SA, SB, "	
* Transformer	T1, T2, " (Note 1)	3.6.8 (d & e)
Valve	V1, V2, " (")	3.6.8 (b)

*Notes:-

1. The Designations marked with a reference to Note 1 shall be used only for the components specified. The remainder may be used for components other than those specified only when no ambiguity can arise e.g. as a functional code for a relay in a diagram in which the component specified does not itself appear.

2. The letters "I" and "O" shall not be used as the last letter of a designation for the components listed in the table above.

3. Any of the following components whose designation is not shown on the item itself or, in the case of resistor coils, on the designation washer, will have the designation shown in brackets on wiring diagrams. The brackets shall be omitted in wiring runs.

Capacitor
Element, Symmetrical, with non linear current/voltage characteristic
Metal Rectifier
Resistor

5. TABLE 2 - RELAYS

Relays are designated by one or more letters on a functional basis. The normal functional designations for relays are shown in the table.

Relay springs shall be numbered.

Coil tags shall be lettered except that when the coil tags are in the same assembly as the springs they shall be numbered.

DESIGNATION	FUNCTION
A	Impulse accepting
AL	Alarm
AS	Key-send answer
B	Guard
BA	Additional guard (B relief)
BB	Busy back
BF	Busy flash
BR	Busy release Busy relay
CD	Impulse control or steering
CA	CD Relief
CB	Coin box discrimination
CC	Call count Counting control
CK	Cancel
CO	Cut off Change over
CR	Hundreds register
CS	Key send call
CT	Cord test Connect through
CW) CX) CY) CZ)	Hundreds storage
D	Called-party, supervisory
DA	Dial (Ans) Meter Control (S & Z metering) Supervisory (Ans)
DB	Meter Control (S & Z metering)
DC	Dial call Supervisory (call) Decode control Drive control
DD	Digit distributor D relief
DR	Tens register
DS	Distributor stepping
DW) DX) DY) DZ)	Tens storage
E	Rotary Impulse control
ES	Emergency switching
ET	Engaged test (manual)
F	Ring trip
FA	Fuse alarm
FB	Finder busy
G	Outlet busy test Rotary hunt control

DESIGNATION	FUNCTION
GB	Group busy
H	Wiper connecting
HR	H relief
HA	First wiper connecting
HB	Second wiper connecting
HD	Hold
HS	Hunt start
I	High Impedance bridging coil (bridge impedance)
IR	I relief
IA	Bridge impedance (ans)
IC	Bridge impedance (call)
IL	Bridge impedance (line)
J	Meter control
JD	Junction discrimination
JH	Junction hunt
JR	Junction release guard
K	Cut drive
KA	K relief
KK	K relief
KR	K relief
LS	Line signalling
LL	LS relief
LA	Supervisory (Ans) "A" Line signal
LB	"B" Line signal
LC	Supervisory (call)
LD	Local discrimination
LO	Lock out
M	2nd sleeve relay (out-going) bothway circuits. Forced release
MM	M relief
MC	Meter control
MD	Meter delay
MH	Manual hold
MN	Monitor
MRR	Thousands register
MS	Motor start
MW) MX) MY) MZ)	Thousands storage
PR	Operator's circuit primary feed
RA	Release Alarm

COMPONENT DESIGNATIONS (contd.)

5. (contd.)

DESIGNATION	FUNCTION
RG	Release guard
RR	Ring or Flash
RT	Routine test
S	Sleeve relay
SS	S relief
SA	Start send Supervisory alarm
SB	Sender busy
SC	Sender control Spare code
SF	Sender find
SK	Speak
SL	SK relief
ST	Start
SZ	Stop send
TA	Tertiary switching (Ans)
TB	Tertiary switching (call)
TP	Time pulse
TS	Through Signal
UR	Units register
UW) UX) UY) UZ)	Units storage
WS	Wiper selecting

6. TABLE - 3

Functional designations for components of two motion selectors, uniselectors, motor uniselectors and mechanical ~~pulse regenerators~~.

	Component	Designation	See Item
Two Motion Selector	MAGNETS		
	Vertical	VM	
	Rotary	RM	
	Release	Z	
	Rotary Release	RZ	
	MECHANICALLY OPERATED SPRINGSETS		
	Vertical Magnet Interrupter	VM	
	Rotary " "	RM	
	Release Magnet	Z	
	Rotary Release Magnet	RZ	
	Level	NP or NPA & NPB	
	11th Step Rotary	S	
	Off-Normal or Vertical Off-Normal	N	
	Rotary Off-Normal	NR	
	Vertical Detent	DD	
	Vertical Wiper	AW	
	Vertical Bank	AB	
	Auxiliary Screw Arc.	ASA	
Uniselector	Magnets	DM or Functional Code	3.7.8(j)
	Interrupter	dm) Prefixed by DM or functional code	
	Test Jack	tj)	
	Wiper Bank Arc	DM or Functional Code suffixed by Wiper/Arc number	3.7.8(j)
Motor Uniselector	Complete	Functional Code	3.7.8 (j)
	MAGNETS		
	Drive	DM	
	Latch	LM	
	MECHANICALLY OPERATED SPRING SETS		
	Ratchet operated	LM	
	Cam	S prefixed by functional code	
	Interrupter	dm) *Prefixed by functional code when shown outside the box.	1.22.7
	Test Jack	tj)	
	Drive Test Key	k)	
	Wiper Bank Arc	DM or Functional code suffixed by Wiper/Arc number	3.7.8(j)
* Mechanical ~~Pulse~~ Regenerator	MAGNETS		
	Transmitting	TM	
	Marking	MM	
	Receive	RM	
	Mechanically operated off-normal springset	N	
	Interrupter	dm prefixed by designation of associated magnet	
	Marking Pin	SP	

7. TABLE - 4

Designations for mechanically operated contacts of Teleprinter and allied apparatus.

Mechanically operated Contacts	Designation
Transmitter	T
"Who are you"	WRU
Paper Failure	PF
Answer Back	AB
"J" Bell	J
Send Receive Switch	SR

8. TABLES 1 to 4 Additional Rules

(a) Capacitor

Where a capacitance is made up of more than one capacitor all component capacitors shall be shown and an additional suffix letter used to identify each, e.g. C1A, C1B, C1C etc.,

Capacitors mounted on other apparatus shall be designated in the normal capacitor range but the designation shall be enclosed in brackets to indicate that the component is not signwritten. The brackets shall be omitted in wiring runs.

(b) Valve & Cathode Ray Tube

Where an electrode of these components is brought out to a terminal on the glass envelope the terminal shall be designated TC.

(c) Fuse

Component and tag designations for fuses shall be shown only when it is necessary to refer to them in wiring information.

(d) Transformer & Operator's Induction Coil

Terminals may be designated by the actual marking shown on the component in place of the normal lower case letters, in which case the designation shall be enclosed in brackets. The brackets shall be omitted in wiring runs.

* (e) Components in Pots

A transformer pot or similar container which accommodates a number of components shall be designated as a unit. The unit will take the designation of the main component e.g. T1, L1 etc. The designations for the other components within the pot shall be shown, but enclosed in brackets to indicate that they are not signwritten, e.g. (R1), (C1) etc. see item 1.9.1.

(f) **Test Jack (Strip Mounted Set)**

Where two test jacks are fitted on a strip mounted set they shall be designated TJA & TJB respectively and the spring numbering for each jack shall commence at 1.

(g) Key

Individual keys bearing the same functional code shall be distinguished by the addition of a further suffix letter, e.g. KRCA, KRCB, etc.,

(h) Resistor

Where a resistance is made up of more than one resistor all component resistors shall be shown and an additional suffix letter used to identify each, e.g. R1A, R1B, R1C etc.,

COMPONENT DESIGNATIONS (Continued)

Tables 1 to 4 Additional Rules (Continued)

8.

(h) Contd.

Resistors mounted on other apparatus shall be designated in the normal resistor range but the designation shall be enclosed in brackets to indicate that the component is not sign-written. The brackets shall be omitted in wiring runs.

*(j) Uniselector

Uniselectors, both ratchet and motor driven, are designated by a functional code of one or two letters except when the function is indicated by the complete circuit in which case the designation DM shall be used. The functional code or DM shall be associated with the number of wipers and bank outlets to form the complete designation as shown in the following typical examples:-

$\frac{DM25}{3}$ - Uniselector with 25 outlets and 3 wipers

$\frac{FD102}{8+8}$ - Motor uniselector, with 102 outlets and 8 pairs of wipers (16 single ended wipers) functioning as a Finder.

$\frac{DM51}{16}$ - Motor uniselector, with 51 outlets and 16 double ended wipers

To identify two or more uniselectors having similar functions use shall be made of additional suffix letters, e.g.

$\frac{FDA102}{8+8}$ $\frac{FDB102}{8+8}$ etc.,

*(k) Two or more circuits on the same plug-in unit or strip mounted set

Where two or more identical circuits are mounted on the same base and neither numerals nor suffix letters are included in the component designation to identify the individual circuits, the components are marked as shown below. The same markings shall be used on diagrams where it is necessary to distinguish between circuits e.g. in battery and earth wiring runs, otherwise basic designations shall be used.

1st Cct.	2nd Cct.	10th Cct.
1A, 1C1, 1R1 etc.	2A, 2C1, 2R1 etc.	10A, 10C1, 10R1 etc.

*(l) Bank contacts in wiring runs

In wiring runs bank contacts shall be identified by the bank or bank arc designation or bank designation and level number followed by oblique stroke and contact number or letter thus:-

AB2/N - Vertical bank contacts

DM2/24 - Uniselector bank contacts

FD14/96 - Motor uniselector bank contacts

P2 9/11 - 2 Motion selector bank contacts

SPARE

RULES APPLICABLE TO ALL ROUTED SCHEMATIC, SHELF JACK AND CROSS CONNEXION DIAGRAMS

1. Dimensions

All diagrams shall be drawn on 13" x 8" sheets or sheets that are a multiple of 13" x 8". The standard sizes for the various types of diagram are listed in sections 6, 7, 8 and 9. The dimensions given shall be defined by continuous lines, which are required for trimming purposes. There shall be a $\frac{3}{16}$" margin along all sides and inside the trimming lines. The inner limits of the $\frac{3}{16}$" margin shall be defined by continuous lines.

The dimensions given do not include the 1" filing margin that is required along one of the 13" or 26" sides.

2. Position of Filing Margin and Title Box

When the diagram is placed so that the filing margin is at the left hand side, the title box shall be right way up at the bottom of the diagram. The right hand and bottom boundaries of the title box shall coincide with the $\frac{3}{16}$" margin lines.

3. Main Body of Diagrams

The main body of the diagram and all component designations shall be right way up either when the filing margin is at the left or when the filing margin is at the top of the diagram. All other printing and designations shall be right way up either when the main body of the diagram is right way up or when it is turned clockwise through 90° from that position.

4. Standard Title Box

The standard title box which is shown in Figs. 1 and 2 page 4.5 shall be used on all diagrams.

Spaces "A" are for signature by the originating manufacturer.

Space "B" is left blank on the master tracing and used on each copy tracing for the name of holding party.

Spaces "C" are left blank on the master tracing and used on each copy tracing for signatures of the holding party.

Space "D" is for G.P.O. approval signature and date.

5. Boundary Line

When diagrams are divided into figures, or figures are sub-divided, the figures so formed shall be outlined by a heavy chain dot boundary line, the long lines of which shall be $\frac{3}{4}$" minimum in length.

* 6. Space for Manufacturers Code

A space approximately 1" x $\frac{1}{2}$" should be left in a convenient position, e.g. top right hand corner, to permit a box to be inserted for manufacturer's code etc.

* 7. Printing

All printing shall be upright.

Figure numbers or letters and suffix letters and the abbreviation "FIG" shall be in $\frac{1}{4}$" characters.

Spring numbers, tag letters and numbers, wiring runs and notes shall be in characters corresponding to an upper case alphabet $\frac{3}{32}$" high. Values, stores references etc. to be in $\frac{3}{32}$" characters.

Designations shall be in $\frac{1}{8}$" characters.

Note: Upper case letters shall be used except that designations shall be as shown in symbols pages.

* 8. Notes

Notes on diagrams shall be numbered and grouped together. Wherever practicable the notes shall be placed so as to leave room for additional notes. Any relevant notes that appear on the equivalent P.O. diagram shall be included. Supersession notes shall not appear on wiring diagrams.

9. Connexions by Cross References

Connexions within a diagram shall be represented by a line (see pages 1.32 items 1 to 4) whenever it is practicable to do so.

When required connexions between different Figs. of the same diagram or between points in the same Fig. may be indicated by cross-references except that cross-references shall not be used within a Fig. relating to a plug-in item.

9. (Cont'd)

Connexions between different diagrams shall be indicated by cross references which shall specify the diagram that the connexions are to be extended to e.g. "To Group Selector ATW 38210 or equivalent." Suffix "0" diagram numbers shall be used for cross-references unless there are special reasons for quoting a later suffix number. Any lead interconnecting two diagrams should have the same designation on each diagram.

*10. **Pre 2000 Type Diagrams**

On pre-2000 type routed schematic diagrams wiring information shall be given only for plug-in equipment. Pre-2000 type shelf jack diagrams shall not indicate the colour or size of the conductors.

*11. **Wire Colours**

(a) Wire colours shall always be shown for battery and earth connexions.

(b) Wire colours shall not be shown for:-

i Plug in apparatus (Selectors, Relay sets)

ii Strip mounted sets

iii Equipment mounted on the M.A.R.

iv Strip mounted equipment connexions between items of apparatus mounted on the same plate except for connexions which are part of the rack cable form [(c) ii refers]

v Machine made cable connexions which are not part of the rack cable form.

vi Cross Connexion Diagrams

*vii Connexions associated with a ∅ sign (see 6.1.4)

(c) Wire colours shall be shown for:-

i Connexions which are part of the rack cable form.

* ii Because of differences between the wiring methods followed by the various manufacturers, and because some diagrams cater for alternative layouts, certain connexions will be included in a rack cable form on some equipment and in the local plate wiring on other equipment; the wire colours for these connexions shall be shown in brackets unless the connexion is a continuation of one that is always included in a rack cable form, when it shall be sufficient to show a wire colour for the connexion that is always included in the rack cable form. Wire colours shall also be enclosed in brackets when associated with the alternative cable or wire symbol item 1.32.11.

*(d) When practicable, for connexions in the same size wire, a different colour shall be used for each wiring point on:-

i Individual relays, test jacks, keys, transformers etc.

ii The "odd" numbered side of the shelf jack

iii The "even" " " " " " "

iv Tags served by the same fanning hole of strips connexion.

v Horizontal rows of uniselector bank contacts.

vi Resistors mounted on the same post.

(e) Wire colours shall be shown adjacent to the wire or wiring to which they apply.

(f) Colours available are listed in T 5241.

*12. **Colour Abbreviations**

Where colours are used on a diagram they may be abbreviated as follows:-

Colour	Abbreviation	Example of Use
Blue	B	
Orange	O	
Green	G	
Brown	BN	Blue White B-W
Slate	S	
White	W	Red Blue Brown R-B-BN
Black	BK	
Red	R	

*13. **Size of Conductor and Type of Insulation of wire**

Normally, diagrams shall indicate the size of conductor but not the type of insulation that is to be used for the various connexions. Under exceptional conditions the type of insulation may be indicated, e.g. when a diagram includes low and high voltage connexions.

On each diagram there shall be one comprehensive note concerning wire sizes. The sizes of wire required for connexions not covered by the note shall be indicated adjacent to those connexions.

*14. **Cabled Connexions**

All cabled connexions, in the same size of conductor, passing from one circuit to the same destination shall, as far as is practicable, be enclosed within the same cable symbol, or linked cable symbol. See items 1.32.11 and 12.

*15. Layout of Apparatus

The wiring information shall be suitable for the apparatus layout shown on the appropriate P.O. information.

*16. Standard Phrases

The following abbreviations shall be used for the designation of Common Services etc.

Amplifier Alarm	Amp. Alm.
Alarm Classification Strip Conn.	Alm. Class. Strip Conn.
Busy Hold Battery	B.H. Batt.
Busying Resistor Battery	Busy. Res. Batt.
Busy Tone and Flash	Busy T & F.
Busy Tone Earth	Busy Tone.
Called Subscriber Held	C.S.H.
* Congestion Announcement	Cngn. Ann.
Continuous Ringing	Cont. Ring.
Continuous Ringing Tone Earth	Cont. Ring. Tone.
Dial Tone Earth	Dial Tone
Deferred Alarm	Alm. D.
Earth	Eth.
Earth Pulses:-	
Controlled by Exch. clock	Give periodicity of pulse e.g. 30 Sec. Eth.
Not controlled by Exch. clock	Give periodicity followed by on & off periods, e.g. C-5 sec. Eth. (0.14 on 0.86 off)
Flicker Earth (from ringer)	FL. Eth.
Flicker Contact Earth (from contact of FL rel).	FL. Contact Eth.
Flicker-Start to FL relay	FL. Rel. Batt.
Fuse Alarm	Fuse Alm. or FA.
Interrupted Battery & Earth	Int. Batt. & Eth.
Interrupted Earth	Int. Eth.
Interrupted Ringing	Int. Ring
Interrupted Ringing Tone Earth	Int. Ring. Tone.
Main Release Alarm	Main Rlse. Alm.
Main Supervisory Alarm.	Main Supy. Alm.
Metering Pulses	Meter Z, Meter S, Meter IU, Meter 2U etc.
Night Alarm	Night Alm. or N.A.
Negative Battery	Neg. Batt.
Number Unobtainable Tone - Battery	N.U.T. Batt.
Number Unobtainable Tone - Earth	N.U.T. Eth.
Overflow Meter	O.F.M.
Permanent Glow Alarm	P.G. Alm.
Permanent Glow Alarm-Batt.	P.G. Alm. Batt.
Positive Battery	Pos. Batt.
Prompt Alarm	Alm. P.
* Pulse Machine Start Battery	Pulse M/C St. Batt.
Release Alarm Bagtery	Rlse. Alm. Batt.
Release Alarm Earth	Rlse. Alm. Eth.
Release Alarm "S" Lead	Rlse. "S"
Release Alarm "ST" Lead	Rlse. "ST"
Release Alarm "Z" Lead	Rlse. "Z"
Ringing Return Battery	Ring, Ret. Batt.
Ringing Return Earth	Ring. Ret. Eth.
"S" & "Z" Pulses (except those described on a functional basis)	Give periodicity of pulse e.g. 6 sec. "Z", 30 sec. "S" etc.

16. Standard Phrases (Contd.)

Supervisory Alarm	Supy. Alm.
Supervisory Alarm Battery	Supy. Alm. Batt.
Supervisory Alarm "S" Lead	Supy. "S"
Supervisory Alarm "ST" Lead	Supy. "ST"
Supervisory Alarm "Z" Lead	Supy. "Z"
Test Trunk Bell	T.T. Bell
Tone Fail	Tone Fail
Toneless Flash	Toneless Flash
Traffic Recorder	Tfc. Recdr.

17. Standard Phrases (for use on Telegraph Diagrams)

The following Standard phrases and abbreviations shall be used for designations on Telegraph Diagrams.

Immediate Release Start (Spare lines and levels)	IR. ST.
" " Signal(" " " ")	IR. Sig.
Station Busy Signal (OCC) Start	OCC. ST.
" " " "	OCC. Sig.
" Fault Pulse	SFP
" Out of Order signal (DER S) start	DER S.ST.
" " " " " "	DER S. Sig.
Teleprinter Speed Test Start	TST. ST.
" " " Signal	TST. Sig.
Test Message ('x' % Distorted) Start	TM 'x'%. ST.
" " ('x'% ") Signal	TM 'x'%. Sig.
" " (switched) Start	TM 'SW'. ST.
" " " Signal	TM 'SW'. Sig.
" " Phasing Pulse	TM. P.P.
Trunks Busy Signal (NC) Start	NC. ST.
" " " "	NC. Sig.
Trunk Circuit Hold and Retest Start	TCHR. ST.
" " " " " Signal	TCHR. Sig.
" Out of Order Signal (DER T) Start	DER T. ST.
" " " " " "	DER T. Sig.
Wait Signal (MOM) Start	MOM. ST.
" " "	MOM. Sig.
Who Are You Signal Start	WRU. ST.
" " " "	WRU. Sig.
" " " Phasing Pulse	WRU. P.P.

FIG.1. STANDARD TITLE BOX WITH DIMENSIONS

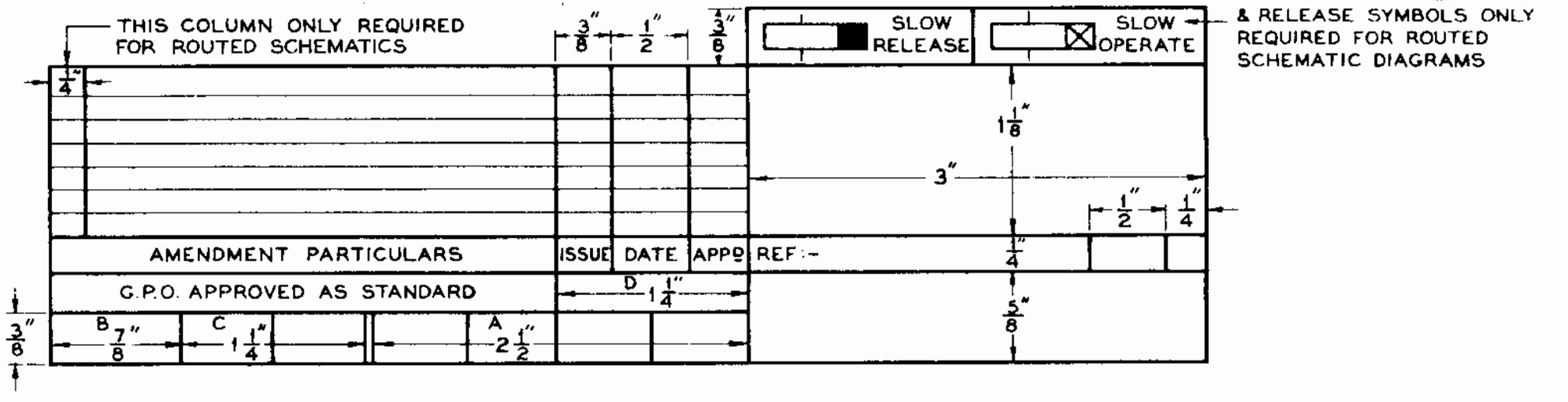
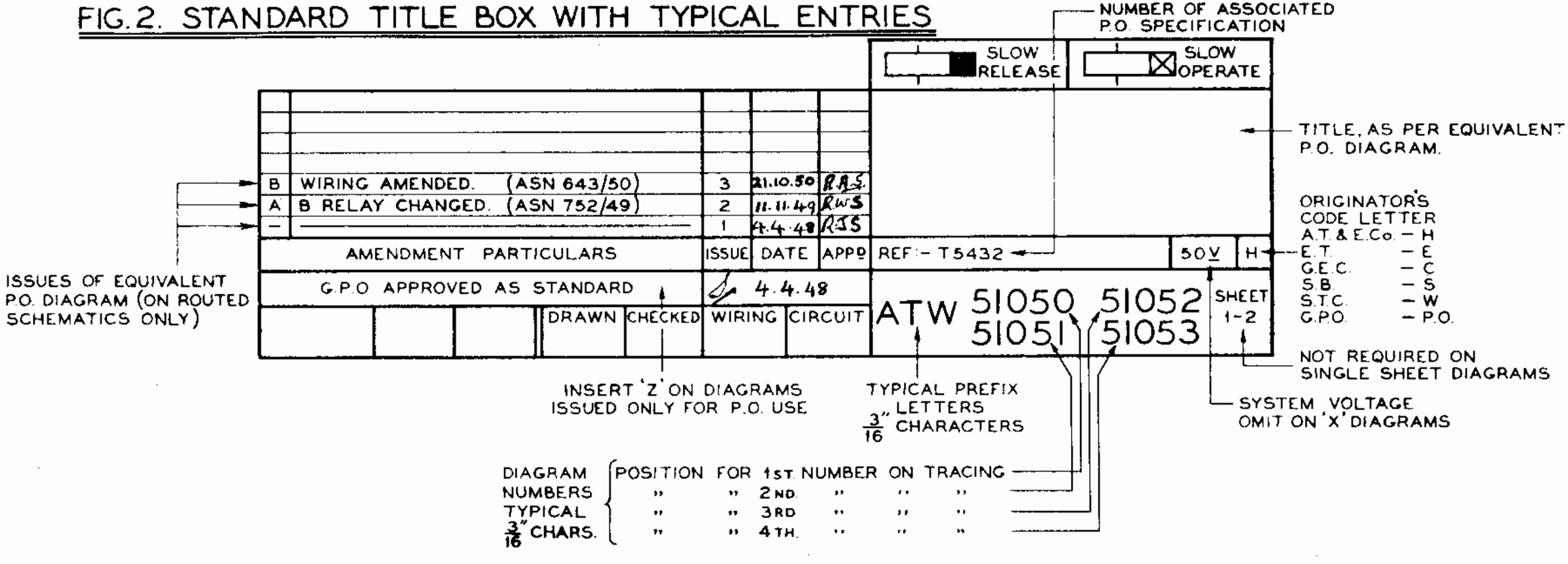


FIG.2. STANDARD TITLE BOX WITH TYPICAL ENTRIES



SPARE

RULES APPLICABLE TO ALL ROUTED SCHEMATIC DIAGRAMS

1. General

Where practicable diagrams shall adopt a layout similar to that of the P.O. Schematic which will, in general, be drawn so that the main sequence of cause to effect is from left to right or from top to bottom.

All apparatus shall be shown in the unoperated position. Where a particular component is operated whilst the circuit is normal (unseized) there shall be a note on the diagram drawing attention to this condition. For the purposes of this rule, the unoperated position of mechanically actuated spring sets shall be the position they assume when the item of which they form a part is in the normal (unseized) condition.

2. Sub-division of Diagrams

The Figure numbers shall agree with those on the basic diagram. The Figures may be subdivided, where necessary, to cover (a) varying rates of provision, (b) alternative wiring or equipment, (c) manufacturing convenience. Each sub-division of a Figure shall be designated by a suffix letter in addition to the Figure number e.g. Fig. 1A, Fig. 1B, Fig. 1C, etc. In cases where the basic diagram employs suffix letters in addition to Figure numbers, it may be necessary to depart from this rule.

3. Changes to Figure Numbers (or Letters) on amended diagrams

When changes have to be made involving any alteration to existing Figure Numbers (or letters), a note shall be added to the diagram, clearly explaining the relationship between the old and new figuring and stating on which issue of the diagram the changes were made.

A reference to the note shall be placed against each Figure number which has been changed.

4. Explanatory Figs. etc.

For explanatory purposes, it may be necessary to reproduce on some diagrams part of another diagram.

The part that is shown for explanatory purposes shall be made a separate Figure of the diagram on which it is reproduced and marked "Part of ....., For Explanatory Purposes Only". Explanatory Figures shall include only such information as is essential for understanding the diagram, e.g. wiring information shall always be omitted, relay coil resistance, resistor values, relay spring numbers, contact unit numbers, etc. will only be included when they are necessary. Explanatory Figures shall be numbered only when the equivalent Figure on the basic diagram is numbered.

5. Alternative Voltages

On diagrams that cater for more than one system voltage, any corresponding alternatives of apparatus items shall be shown by means of a Table, with references to the Table adjacent to each item that is affected. This rule need not be followed if three or less items are affected when the alternative resistance values or codes may be shown adjacent to the affected items.

6. Contact Unit Numbering

Contact unit numbers shall be shown adjacent to detached contacts of relays, keys, mechanical contact etc. units to which they refer. They shall not be shown in wiring runs.

* 7. Contact Units not associated with Relays, Magnets, Shelf and Switchboard Jacks, Plugs, Dials etc.

Where the number of contact units associated with a particular component is not indicated by the component designation, an inset shall be included on the diagram. In the inset the number of contact units shall be indicated below the component designation of each item. Each TJ spring is considered to be a unit, except that the contact type changeover comprising three springs is considered to be one unit. All spare contact units and springs shall be shown and numbered on the diagram.

8. Typical Insets

(a) Two Motion Selector.

N	NR	S	NPA	NPB	TJ
2	1	3	1	1	14

(b) Relay Set

TJ
8

9. Typical Insets for Diagrams that include Keys

(a) All the key insets in the same Figure of a diagram shall be grouped together.

9. (contd.)

The contact units on the two sides of double throw keys shall be numbered independently.

(b) Single Throw Key.

$$\frac{\text{CONTROL (KC)}}{3}$$

(c) Double Throw Key

$$\frac{\text{TEST LINE (KTL)}}{2} + \frac{\text{TEST EXCH. (KTE)}}{2}$$

(d) For keys where it is necessary to indicate that the normal position has a circuit function.

$$\frac{\text{SPEAK (KSP)}}{4} + \text{MONITOR (NORMAL)} + \frac{\text{CALL (KCA)}}{4}$$

$$\frac{\text{SPEAK (KSP)}}{3} + \text{MONITOR (NORMAL)}$$

(e) Mechanically Coupled Keys.

$$\frac{\text{TEST LINE (KTLA+KTLB+KTLC)}}{4+6+6} + \frac{\text{TEST EXCHANGE (KTEA+KTEB+KTEC)}}{2+4+2}$$

*** 10. Distance between Symbols**

Any line connecting two symbols, or a symbol and a tapping point, shall not be less than ¼" long.

*** 11. Wiring Routes**

The wiring routes shall be arranged to give the shortest practicable runs. (See items 6.1.5 and 6.2.6 for selectors and relay sets respectively.

*** 12. Order of Wiring on Relays**

When two or more tags on a relay are included in the same wiring run the order of wiring shall be

(a) Springs 21 to 29
(b) Coil tags a – e
(c) Springs 1 to 9

13. Uniselector Bank Wiring

When wiring runs are not given the diagram shall show the physical connexions. When wiring runs are given the diagram need not show the physical connexions. When a wiring run is used it shall include every point in the run, i.e. the connexions in a particular wiring sequence shall not be covered partly by physical representation and partly by a wiring run.

14. Connexions to Wiring Tags

In so far as is practicable, wiring shall be routed so that not more than two wires are terminated on a tag; this rule, however, does not apply to tags which make special provision for terminating a number of wires.

15. Connexions to Simple Make or Simple Break Contacts.

When conditions permit, the moving spring of all simple make or simple break contacts shall be connected either directly or indirectly to earth; the non-moving spring either directly or indirectly to positive battery, negative battery, A.C. or Tone supply. The initial circuit conditions shall determine the contact connexions.

*** 16. Pairs, Triples and Screened Wiring**

Pairs, Triples and Screened wiring shall always be indicated by the appropriate symbols (items 1.33.2 to 7). Pair or triple symbols bearing the same number shall be used throughout the wiring run of any particular wire colour on one diagram; when the run extends to another diagram a different pair number may be used on that diagram. Wherever practicable, pairs and triples should start and should finish on an item that is connected to both wires in the pair or the three wires in the triple.

17. Conventions

(a) Round Brackets are used:

(i) in wiring runs to indicate an optional connexion, e.g. BR3 – (A2) – Fa indicates

17. (Contd.)

that the connexion to A2 is not always required.

(ii) When enclosing a wire colour, to indicate that the colour applies only to wires that are included in the rack or position cable form (see item 4.2.11(c)).

(iii) When enclosing the designation of a component listed in Note 3 page 3.2, to indicate that the component is not sign written, e.g. (R1A) is an unsignwritten resistor.

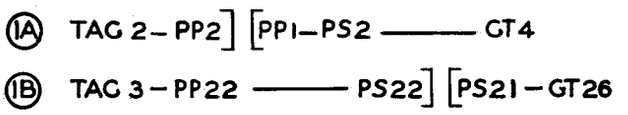
(iv) As part of a component designation for a relay, to indicate that the relay has a separate N.I. winding, e.g. $\frac{A(2)}{2}$ has an N.I. in addition to an inductive winding. The N.I. winding is designated (A) (see item 1.1.13)).

(v) When enclosing a tag designation of a component, to indicate a departure from the rules for standard designations. (See item 3.1.2(c).

* (b) Square Brackets

Used in wiring runs to indicate a break in continuity (mainly applicable to paired wiring) e.g.:-

(i)

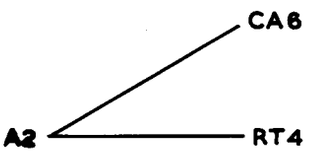


Indicates that the 'A' wire is broken at PP and that the 'B' wire is broken at PS.

(ii)

Indicates that when KC is fitted the wire is broken at KC. When KC is not fitted MN2 is connected to SK21.

(c) Parallel Feed



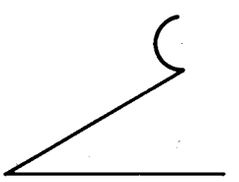
Indicates that A2 is connected direct to both CA6 and to RT4.

(d) Tee

Indicates that the fuse is connected to AAe and that AAe is connected to DDe

(e) Combined Parallel Feed and Tee

Items 5.3.17(c) and 5.3.17(d) may be combined thus



* 18. **Connexions to Resistors.**

Battery and earth connexions to resistors shall be terminated on tags b and a respectively.

* 19. **Spark Quench Connexions.**

On spark quenches consisting of a single unit capacitor in series with a resistor, the resistor shall be shown connected to tag b of the capacitor.

* 20. **Layout Sketch.**

A layout sketch shall be used for Rotary Switches and for other items where the tags cannot easily be identified.

SPARE

RULES APPLICABLE TO ROUTED SCHEMATIC OTHER THAN RACK COMMON SERVICE DIAGRAMS

1. Sizes

The normal diagram sizes are:-

13" x 8"
13" x 16"
13" x 24"
26" x 16"
26" x 24"

} Exclusive of filing margin (see item 4.1.1)

The exceptional diagram sizes are:-

13" x 32"
13" x 40"
26" x 32"
26" x 40"
26" x 48"

} Exclusive of filing margin (see item 4.1.1)

2. Provision of Fuses

Note 1 on the diagram shall state the scale of provision of fuses and their rated values.

3. Leads Entering or Leaving a Diagram

All leads entering or leaving a diagram shall be shown and designated, except that when a routiner access lead is terminated on the same "U" point as another I/C or O/G lead the routiner access lead shall be indicated only by the routiner access symbol (item 1.17.1).

*4. Common Services

In general each diagram shall show the battery and earth wiring from the fuse post and earth bar respectively. For plug-in items and strip mounted sets the internal battery and earth wiring shall be shown in the figure to which it applies, and shall not be shown as a continuation of the rack wiring. In wiring runs to relay plates that include battery and earth terminals, separate leads shall be shown from the terminals to each row of relays. Wiring runs that apply to only one figure of a diagram shall, when practicable, appear at the bottom right hand corner of the figure. In those cases where it is necessary to refer to another diagram for battery and earth wiring information "Ø" signs shall be used in accordance with items 1.36.1 and 2 and a note - "Ø" For wiring see TPW XXXXO or equivalent".

Wiring information for the distribution of common services, other than battery and earth, shall not be shown on the diagrams that use the common services but the connexions to the common services shall be indicated in accordance with item 1.36.3 and a note "Ø For wiring see TPW XXXXO or equivalent". The Ø sign shall only be used as a reference to Rack Common Service Diagrams.

On diagrams that require the same common services to be connected to a number of points on the diagram the wiring between these points shall be shown by means of a wiring run.

*5. Order of Wiring on Two Motion Selectors

*The wiring shall progress from the first to the last item that is applicable in the list shown below:- (see 6.2.10)

(a) "U" points lower or upper plug
(b) Bottom L.H. relay position (as seen from rear)
(c) Up and round plate clockwise to bottom R.H. relay position (as seen from rear)
(d) Vertical magnet coil
(e) Vertical magnet springs
(f) Normal rotary springs
(g) Off-normal springs
(h) 11th Step springs
(j) Normal Post Springs (1st Set)
(k) Normal Post springs (2nd Set)
(l) Rotary magnet springs
(m) Rotary magnet coil

} For pre 2000 type selectors the order of wiring shall be modified to give the shortest practicable route.

RULES APPLICABLE TO ROUTED SCHEMATIC

OTHER THAN RACK COMMON SERVICE DIAGRAMS (Continued)

5. (Continued)

(n) Wiper Cord block

(p) Lower rear cover or capacitor box } Within the capacitor boxes the order shall be

(q) Upper rear cover or capacitor box } (i) Capacitors (ii) Rectifiers (iii) Resistors (iv) Ballast Resistors

(r) Spark quench capacitor in rear clip

(s) Test jack

(t) Lamp jack.

***6. Order of Wiring on Plug-in Relay Sets**

The wiring shall progress from the first to the last item that is applicable in the list shown below. (see 6.2.10 below)

(a) "U" points upper plug to top R.H. relay (as seen from rear)

(b) "U" points lower or middle plug to bottom L.H. relay (as seen from rear)

(c) Top R.H. or bottom L.H. relay round plate clockwise to top L.H. relay or to bottom R.H. relay respectively (as seen from rear)

(d) Lower rear cover or capacitor box | Within the capacitor boxes the order will be

* (e) Middle rear cover | (i) Capacitors (ii) Rectifiers (iii) Resistors

(f) Upper rear cover or capacitor box | (iv) Ballast Resistors

(g) Test Jack (except uniselector test jacks)

(h) Lamp jack

7. Uniselectors on Plug-in Relay Set

The order of the wiring points shall be:-

(a) When the uniselector starts the point to point wiring:- interrupter springs, magnet, wipers, contacts 1 to 25, test jack.

(b) When the uniselector is intermediate in, or finishes the point to point wiring:- Test jack, contacts 25 to 1, wipers, magnet, interrupter springs.

8. "U" Points which make contact

All "U" points which make contact when a plug-in item is removed shall be listed in a note on the diagram e.g. "Shelf jack U points 2 and 4, 9 and 11, 1 and 3, 17 and 19 make contact when relay set is removed".

9. Directors, Coders and Senders On Channel Type Bases

These are made up of two plates fixed together. The order of wiring on each plate shall be in accordance with item 6.2.6. Connexions between the two plates shall be via a cable form at the top of the plates.

***10. Looping on Shelf Plugs**

As far as possible looping on shelf plug points shall be avoided. This may make it necessary to depart from the order of wiring given in items 6.1.5 and 6.2.6 above.

RULES APPLICABLE TO RACK COMMON SERVICE DIAGRAMS

1. Sizes

The normal diagram sizes are:-

13" x 8"
13" x 16"
13" x 24"
13" x 32"

Exclusive of filing margin (see item 4.1.1)

2. Notes

On multi-sheet diagrams all notes shall appear on sheet 1.

3. Figure Per Common Service

Each particular common service shall be in a separate Figure, each separate Figure may be sub-divided but all sub-divisions of the same Figure shall have the same Figure numbers e.g. Fig. 2A, 2B, 2C.

The fuse Alarm arrangement for the system voltage fuses mounted on the rack shall be Figure 1.

4. Allocation of Fuses

Fig. 1 (Fuse Alarm) shall show the allocation of fuses to the supervisory relays, lamps etc. that are part of the diagram. Battery and earth wiring information for these items shall be given. When practicable, the information should appear at the bottom of the figure to which it applies.

Fig. 1 shall not show the allocation of fuses for circuits that are not a part of the diagram.

* 5. Table of Tag Allocations.

Each diagram shall include a table showing the allocation of rack miscellaneous strip connexion terminals. On multi-sheet diagrams the table shall appear on sheet 1.

SPARE

RULES APPLICABLE TO SHELF JACK DIAGRAMS

1. Sizes

Diagrams should be drawn on 13" x 8" sheets when practicable, but 13" x 16", 13" x 24" or 26" x 16" sheets may be used when necessary (All sizes are exclusive of filing margin, see item 4.1.1).

2. Figure Numbers

The figure numbers used on shelf jack diagrams shall be the same as those used for the corresponding item on the equivalent routed schematic e.g. if on the routed schematic Figs. 1. 3, and 4 are for strip mounted items and Figs. 2 and 5 for plug-in items, then the shelf jack diagram will consist only of Figs. 2 and 5.

If this is not practicable, e.g. because the shelf jack diagram has to include alternative Figs. for one Fig. of the routed schematic, the Figs. on the shelf jack diagram shall be given suffix letters that are not used on the equivalent Fig. of the routed schematic.

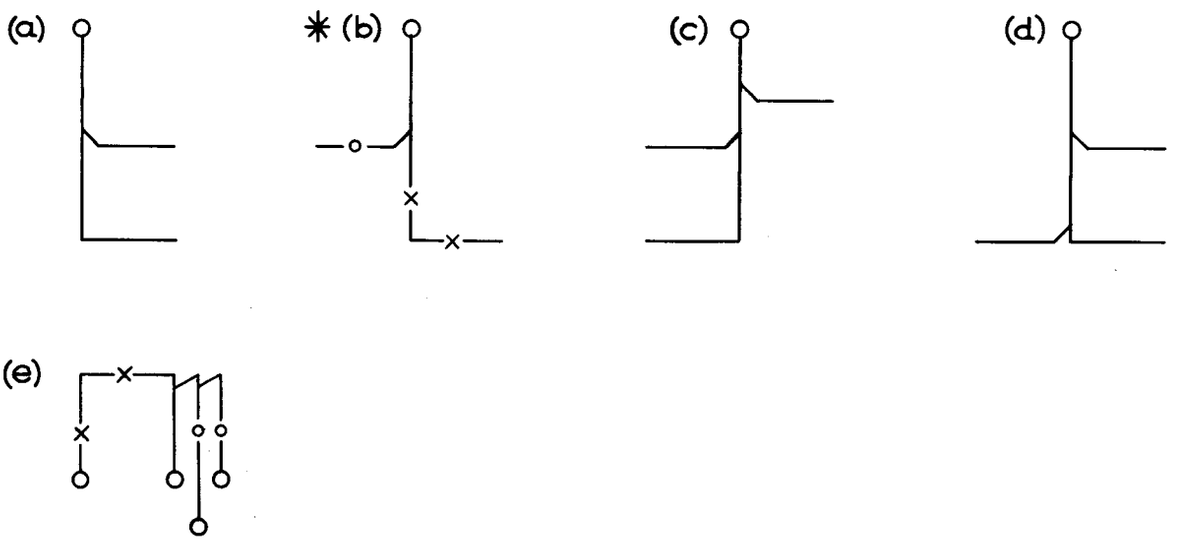
3. Alternative Conventions

When the shelf jack and the routed schematic diagram show the same connexions as alternatives. the shelf jack diagram shall use the same conventions as the routed schematic.

*4. Connexions to 'U' points on Shelf Jack

Oneisingle line only from above and one only from below shall be shown to any one 'U' point on the shelf jack.

When the circuit calls for more than one connexion, the additional connexions shall be shown as in examples (a) to (e) below.



*5. 'U' Points which make contact.

All 'U' points which make contact when a plug-in item is removed shall be listed in a note, e.g. "Shelf-Jack 'U' Points 2 & 4, 9 & 11, 1 & 3, 17 & 19 make contact when relay set is removed."

SPARE

RULES APPLICABLE TO CROSS CONNEXION DIAGRAMS

1. Sizes

All diagrams shall be 13" x 8" (sizes exclusive of filing margin, see item 4.1.1) unless P.O. agreement to the use of a larger sheet has been obtained.

2. Figures

Each alternative arrangement for cabling or jumpering shall be shown in a separate Figure. To avoid confusion with the Figure numbers of the equivalent routed schematic, the Figs. shall be lettered e.g. Fig. A, Fig. B etc.

*3. Equivalent Schematic Diagram

The equivalent routed schematic shall be represented by a full line box or boxes which shall show the title, abbreviated if necessary, and the diagram number e.g. Group Selector ATW 47270 Fig. 1A or equiv.

The strips connexion which are provided for terminating the cabling from the equivalent routed schematic, shall be represented by item 1.33.9(a). The connexions from the equivalent routed schematic to the T.D.F., I.D.F. and M.D.F. shall be indicated and enclosed in cable symbols (item 1.32.11). Paired conductors shall be indicated by the explanatory pair symbol [item 1.33.2(b)].

*4. Associated Routed Schematic Diagrams

Associated routed schematics to which jumpering is shown, shall be represented by broken line (Ghost) boxes which shall include the title, abbreviated if necessary, of the associated diagram e.g. Group Selector. The strips connexion on which the cabling from the associated diagrams is terminated shall be represented by item 1.33.9(b). Cable and pair symbols shall not be shown on the cabling from associated diagrams.

*5. Layout and Signwriting Information

The tag layout of the I.D.F. strips connexion for the equivalent circuit, together with signwriting information shall be shown. Diagrams that show T.D.F. terminals shall include the note "For arrangement of terminals on T.D.F. see TP 2029", except that when a diagram includes T.D.F. terminals which are not covered by TP 2029, it shall show the tag layout of the T.D.F. strips connexion.

*6. Notes

Notes shall be numbered separately on each sheet of a multi-sheet diagram e.g. 1.1, 1.2, 1.3 etc. on sheet 1; 2.1, 2.2, 2.3 on sheet 2 etc. (item 4.1.8 refers).

SPARE