

SUB-SECTION **AB** DRAWING SYSTEM

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SYSTEM OF DRAWING CIRCUITS.

In order to make it easier to follow and, where necessary memorize, circuit diagrams, all those in this book have been drawn on one system. The same system has also been used for the figures in the Admiralty Handbook of W/T (1931) and the Wall Drawings produced in the Signal School, Portsmouth. The sketches in all "Books of Instruction" produced since 1930 are also based on this system, except in the case of wiring diagrams, where, of course, the geographical position of the various items governs the lay out of the diagram.

The system is described below and the symbols used are shown on pages AB5 to AB9.

Power supply is to be fed in from the right. H.T. supply is to be drawn above L.T. supply. Auxiliary circuits are to be fed in from bottom right in as straight a line as possible and led to their respective hobbins, etc., from below, keeping the leads straight, except in the case of Wa/T sets where it has been found, after trial, to simplify the sketch by feeding in most of the auxiliary circuits from above.

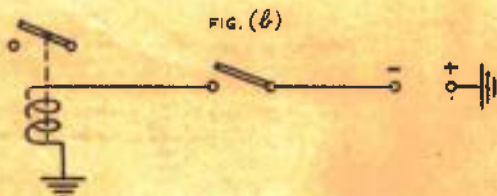
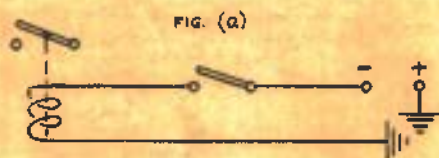
Keep all valves in one straight horizontal line, with the exception of small valve attachments in transmitters (e.g. 4H in Type 37S) and heterodyne valves in receivers (e.g. B12). Pairs of valves connected in push-pull should be drawn vertically one over the other and where there are more than one pair, the upper and lower banks should be drawn in line (e.g., Type 401).

The leads from the valve electrodes should be drawn as follows:- anode leads upwards, filament leads, downwards, grid leads downwards although in this case they may have to be taken up first to pass through a transformer etc.

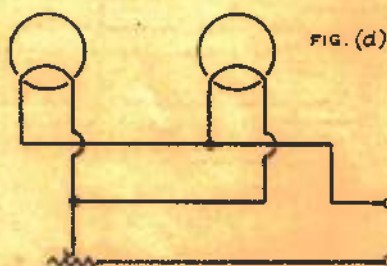
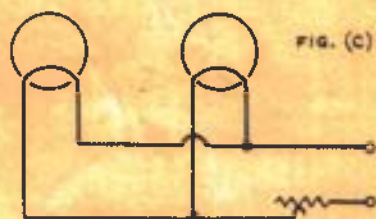
Oscillatory circuits should be drawn to the left of the valve except in the case of divided inductance circuits which are drawn to the right (e.g. Type 43).

Aerial circuits are drawn to the left of the circuit to which they are coupled and should if possible be on the extreme left hand side of the figure, except in the case of certain circuits, where it may be necessary to draw the aerial circuit horizontally along the top of the picture (e.g. Type 42). When, however, the aerial can be coupled to more than one set (e.g. Type 36) it should be placed mid-way between two of them.

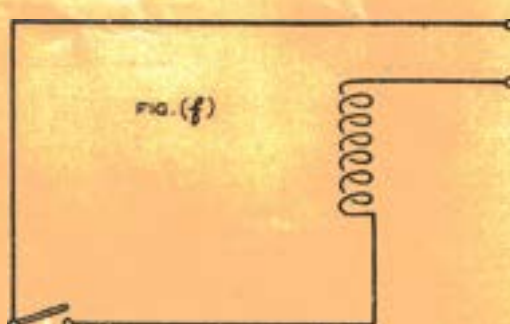
When a circuit is completed through earth the circuit should be shown by drawing the earth connections close together as shown in figure a. and not as in figure b. for although the method recommended may involve an extra line it does indicate clearly how the circuit is completed, especially in the more complicated sketches.



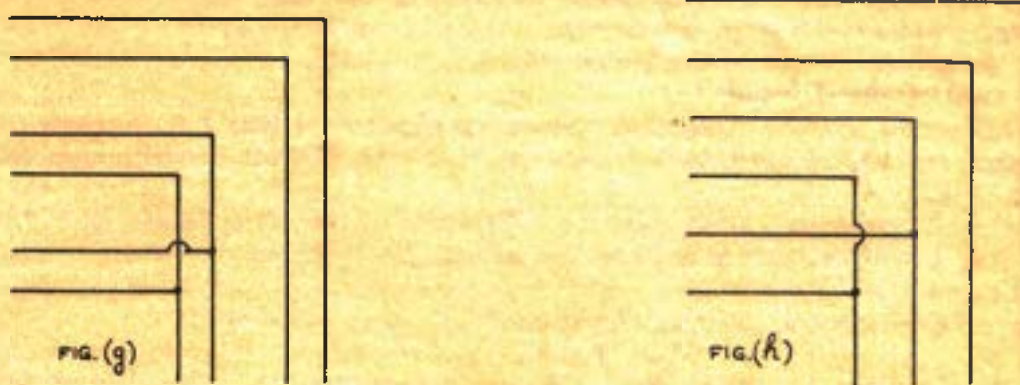
Avoid unnecessary cross-overs and kinks and also putting a figure of 8 cross-over in a feed, that is to say follow the method shown in figure c. and avoid that in figure d.



When a circuit has to be broken by a magnetic key, which by virtue of its other functions (e.g. acting as a send-receive switch) has to be placed at a distance from the circuit to be broken it is advisable to run the leads to the break close together as in figure e. and not as in figure f.

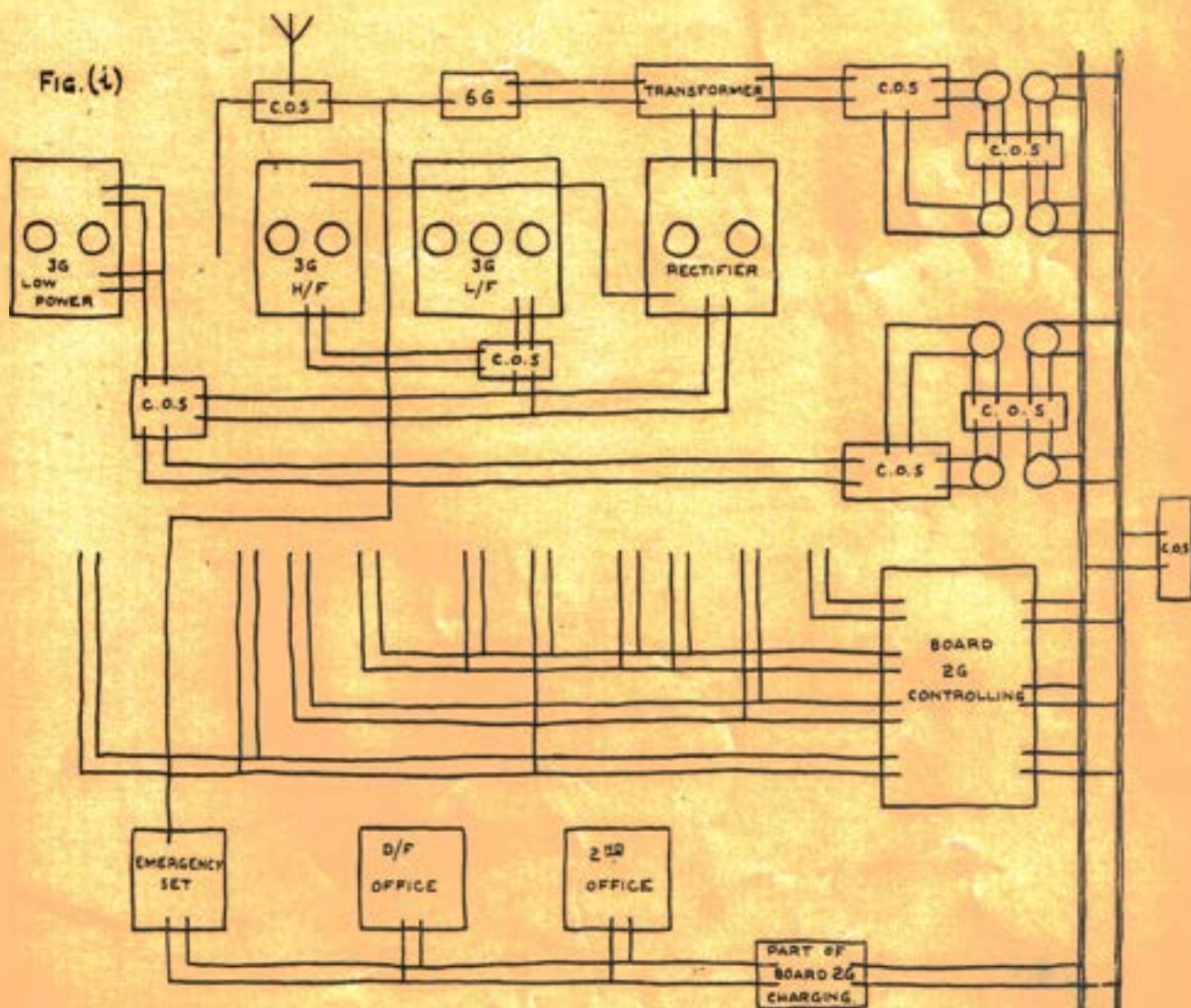


When several pairs of leads have to be run, keep each pair fairly close together and well spaced from the next pair, as in figure g, and not as in figure h.



When a comparatively complicated set has to be drawn, start by sketching very rough simplified diagrams of each separate circuit to be shown, on the system already explained. Trim the bits of paper on which these diagrams are drawn to as small a size as convenient and lay them out on a large sheet of paper in the approximate positions they are eventually to occupy. It is best at this stage to make a small key plan, showing these positions and the proposed connections and supplies.

Figure i. below shows the actual rough sketch from which the complete sketch of Type 36 (figure x. page R44) was later drawn.



When circuits are extracted from a complete diagram they are laid out to agree with it.

<u>BLACK</u>	Filaments which are not at H.T. potential (i.e., not in rectifier valves). Mechanical connections between poles of switches, etc., which are not electrical connections. Cores of transformers Arrows of variable condensers, variometers, coupling, etc. Outlines of boards, panels, etc., that are not screened. Cathodes of indirectly heated valves. <i>Neutralising circuits</i>
<u>BLUE</u>	Heater circuits. Negative busbars and negative of main D.C. supplies. Heater circuit of indirectly heated valves. In Wa/T sets, 20 volt circuits supplied from generator.
<u>RED</u>	H.T. Supplies. Anode circuits. Filaments of Rectifier Valves (at H.T. Potential). Positive busbars and positive of main D.C. Supplies
<u>GREEN</u>	Grid circuits. 20 volt circuits
<u>BROWN</u>	A/F circuits. Telephones. A.C. Low Tension Circuits. Secondary of Induction Coils. Microphone Circuits.
<u>ORANGE</u>	D.C. and auxiliary circuits from busbars. Auto-starters, when not shown in detail.
<u>VIOLET</u>	R/F Circuits and by-pass condensers. Spark and closed oscillatory circuits. Wavemeters.
<u>YELLOW</u>	Screens.

SYMBOLS.

AB5.



AMMETER.



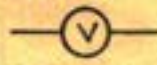
SHUNTED AMMETER.



AMMETER WITH TOROIDAL TRANSFORMER.



GALVANOMETER.



VOLTMETER.



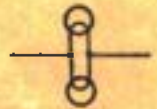
FREQUENCY METER.



MILLIAMMETER.



LAMP.



LAMPS IN PARALLEL.



LAMP WITH VARIABLE SHUNT.



NEON LAMP.



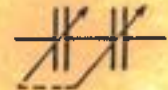
FIXED CONDENSER (SMALL VALUE).



FIXED CONDENSER (LARGE VALUE).



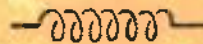
VARIABLE CONDENSER.



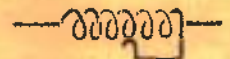
GANGED CONDENSERS.



DIFFERENTIAL CONDENSER.

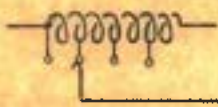


FIXED INDUCTANCE.



VARIABLE INDUCTANCE.

SYMBOLS.



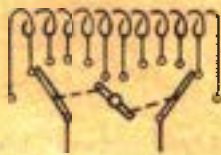
TAPPED INDUCTANCE.



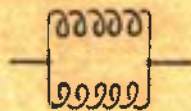
INDUCTANCE WITH CORE.



INDUCTANCE WITH RANGE SWITCH.



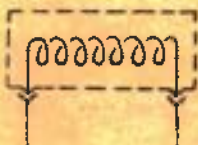
INDUCTANCE WITH SYMMETRICAL RANGE SWITCH.



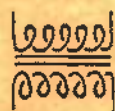
INDUCTANCES IN PARALLEL.



VARIOMETER.



PLUG - IN COIL.



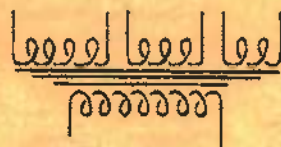
1 - 1 RATIO TRANSFORMER.



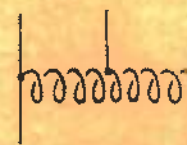
STEP - DOWN TRANSFORMER.



STEP - UP TRANSFORMER.



MULTIPLE SECONDARY TRANSFORMER.



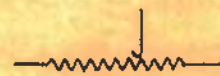
AUTO - TRANSFORMER.



FIXED INDUCTIVE RESISTANCE.



FIXED NON - INDUCTIVE RESISTANCE.



VARIABLE INDUCTIVE RESISTANCE OR RHEOSTAT.



VARIABLE NON - INDUCTIVE RESISTANCE.



TAPPED INDUCTIVE RESISTANCE.



LINK (CLOSED).



LINK (OPEN).



FUSE.



HORN BREAK WITH FUSE.

SYMBOLS.

AB7.



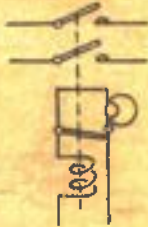
SIGNALLING KEY (WITH TWO CONTACTS).



SIGNALLING KEY (WITH FRONT AND BACK CONTACTS).



HAND OPERATING AND SIGNALLING KEY.



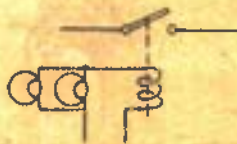
DOUBLE POLE MAGNETIC SWITCH WITH ECONOMY LAMP.



EMERGENCY LINK.



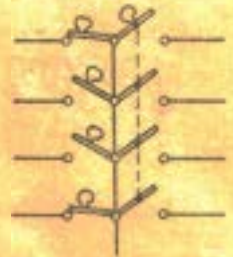
SINGLE POLE MAGNETIC SWITCH.



SINGLE POLE MAGNETIC SWITCH WITH LAMP RESISTANCE.



FLEXIBLE CHANGE-OVER CONNECTION.



MULTIPLE ~~SWITCHES~~ SWITCHES SEPARATE TO LEFT, GANGED TO RIGHT).



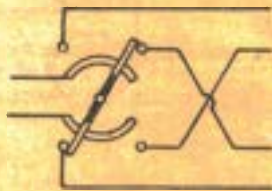
DOUBLE POLE CHANGE-OVER SWITCH (TO CIRCUITS IN OPPOSITE DIRECTIONS).



DOUBLE POLE SWITCH.



DOUBLE-POLE CHANGE-OVER SWITCH (TO CIRCUITS IN SAME DIRECTION).



RING MAIN CHANGE OVER SWITCH.



GATE SWITCH (BREAKS ON OPENING GATE).



GATE SWITCH (MAKES ON OPENING GATE).



EARTH CONNECTION.



QUARTZ.



LIGHTNING ARRESTER.



GAS GAP LIGHTNING ARRESTER.



LOOP AERIAL
(RECTANGULAR).



LOOP AERIAL
(TRIANGULAR).



FRAME AERIAL.



AERIAL.



ROTATING SPARK GAP.



SPARK GAP.



QUENCHED SPARK GAP.



SINGLE WAVE RECTIFIER VALVE.



DOUBLE WAVE RECTIFIER VALVE.



3 ELECTRODE VALVE.



4 ELECTRODE VALVE
(SCREENED GRID).



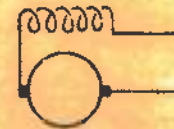
5 ELECTRODE VALVE
(PENTODE).



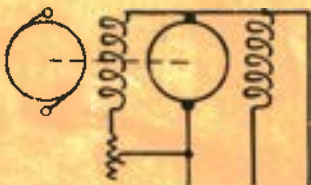
3 ELECTRODE INDIRECTLY
HEATED VALVE.



WATER-COOLED "T" VALVE.



D.C. MOTOR (SERIES)



MOTOR ALTERNATOR.
WITH ALTERNATOR
FIELD REGULATOR.



LOUD SPEAKER.



MICROPHONE.

SYMBOLS.

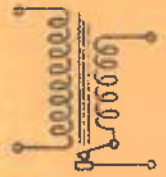
AB9
31/1/33.



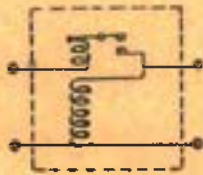
D.C. MOTOR (SHUNT)



MOTOR STARTER
(HAND)



INDUCTION COIL.



REVERSE CURRENT SWITCH.



METAL RECTIFIER.



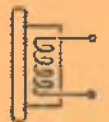
TELEPHONES



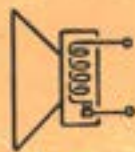
THERMO-GALVANOMETER.



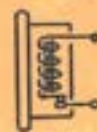
BELL.



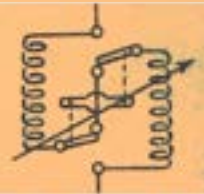
BUZZER REPEATER



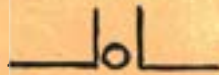
LOUD SOUNDING BUZZER



BUZZER



VARIOMETER
(COILS IN SERIES
OR PARALLEL).



Aerial Plug Fittings.