SUB - SECTION

RB

TYPE 31 PAGE RB2

RB2

TYPE 31

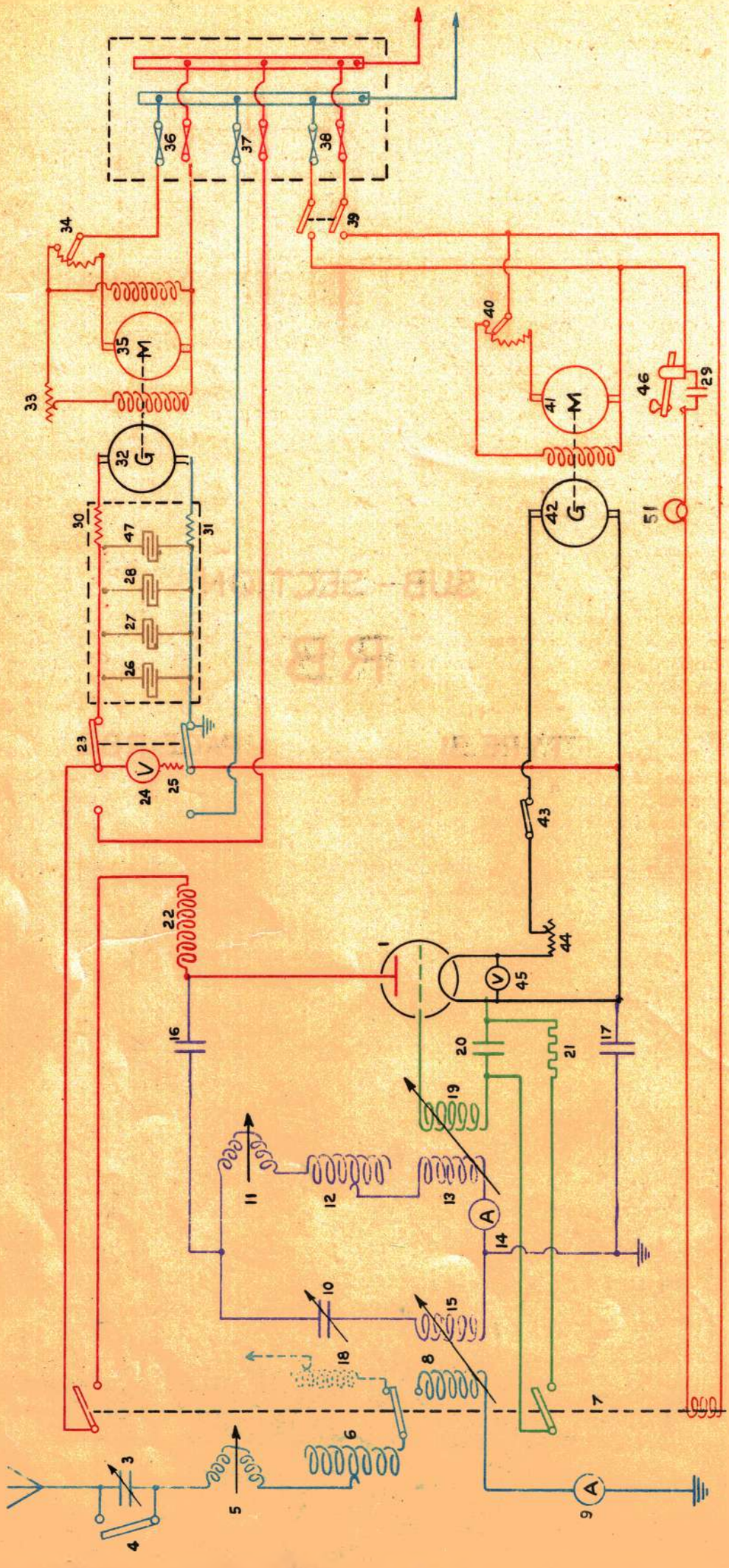

FIG. 2.

RB 3
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TYPE 31

Date of design:- 1917.
Frequency range:- 600 - 1000 kc/s.
Power supply:- ¼ kW. D.C. Generator.
Associated Wavemeters:- Patt. 1492B or G9.
Valves used:- One NT1.

Wave form	Method of producing oscillation.	Nature of circuit	Grid Excitation	Feed	Aerial Excitation	High oscillating potential electrode
C.W.	Self	Tuned circuit between anode and filament.	Mutual Inductive	Parallel	Mutual Inductive.	Anode

Type 31 is a single valve low power C.W. transmitter and is being replaced by Type 45.

A full explanation and a simplified sketch of the circuit used are given in Admiralty Handbook of W/T (1931) paragraphs 631(2) and 632.

The majority of the units used in the set are contained in two boxes. See figures c, d and e. One box, marked "Aerial Coil Secondary" contains the aerial fine tuning coil (5) the aerial rough tuning coil (6) the aerial coupling coil (8) and the primary coupling coil (15). The other box, marked "Aerial Coil", contains the primary fine tuning coil (11) the primary rough tuning coil (12) the primary grid coupling coil (13) the two 5 jar insulating condensers (16) and (17) and the grid coupling coil (19).

The H.T. supply is obtained either from a 750 volt D.C. generator (32), with a generator field regulator (33), or from the ships 220 volt mains through the H.T. change over switch (23).

In the 750 volt position the negative of the H.T. C.O.S. (23) is connected direct to earth and a cushioning unit, consisting of four Helsby condensers (26) (27) (28) (47) and two mat resistances (30) (31), is used to eliminate any variations of voltage from the generator armature.

In the 220 volt position the H.T. C.O.S. (23) is not earthed.

Two 5 jar insulating condensers (16) and (17) are fitted in the "Aerial Coil" box. One condenser (16) is connected between the valve anode and the closed oscillatory circuit to prevent a short circuit between H.T. positive, through the closed oscillatory circuit and earth when the H.T. C.O.S. (23) is in the 750 volt position. The other condenser (17) prevents the ships mains being earthed through the connection between the common H.T. and L.T. negative and the earth of the closed oscillatory circuit.

The filament supply is obtained from a 17 volt D.C.Generator (42) with a filament rheostat (44) and voltmeter (45) for adjusting to the correct voltage for the valve in use.

The magnetic key (7) is operated by the ships mains through a morse key (46). The three contacts of the magnetic key carry out the following functions:-

Upper contact. Makes and breaks the positive H.T. supply.
Middle contact. Connects the aerial circuit either to the receiver or to the transmitting aerial coupling coil (8).
Lower contact. Makes and breaks the grid leak resistance circuit.

The lower contact of the magnetic key (7) should be adjusted to break before the upper contact to control the valve oscillations by the grid leak instead of the H.T. supply. By using this method of grid signalling sparking at the H.T. contact of the magnetic key is prevented.

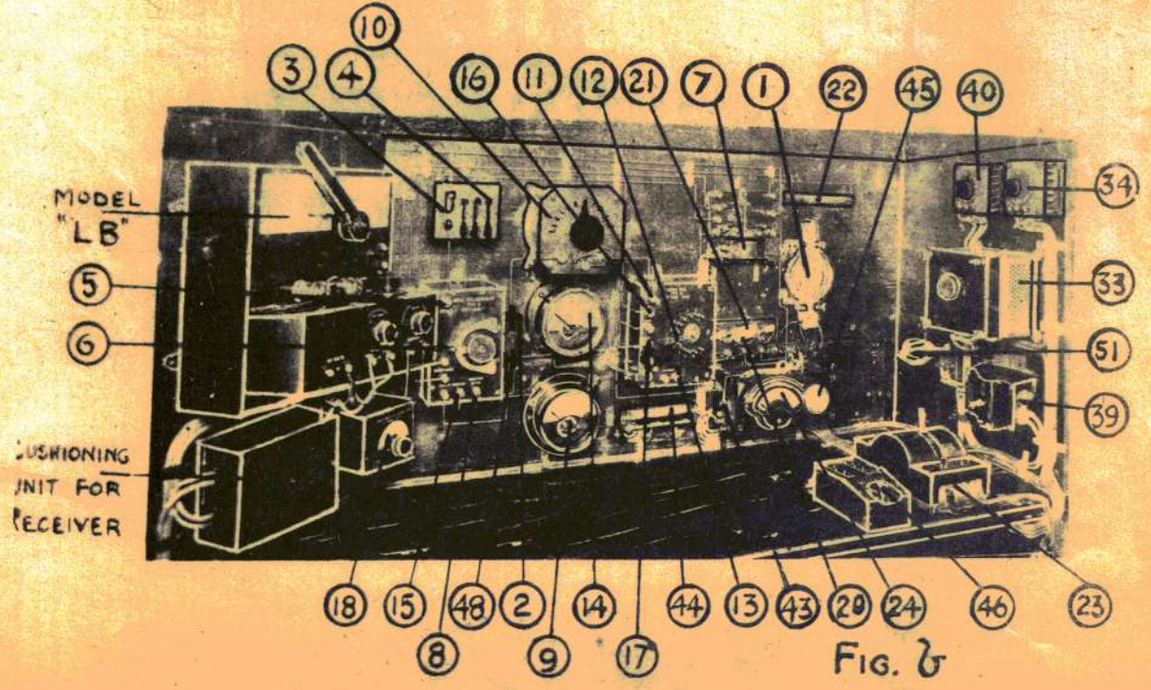

FIG. 6

RB4
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TYPE 31

P

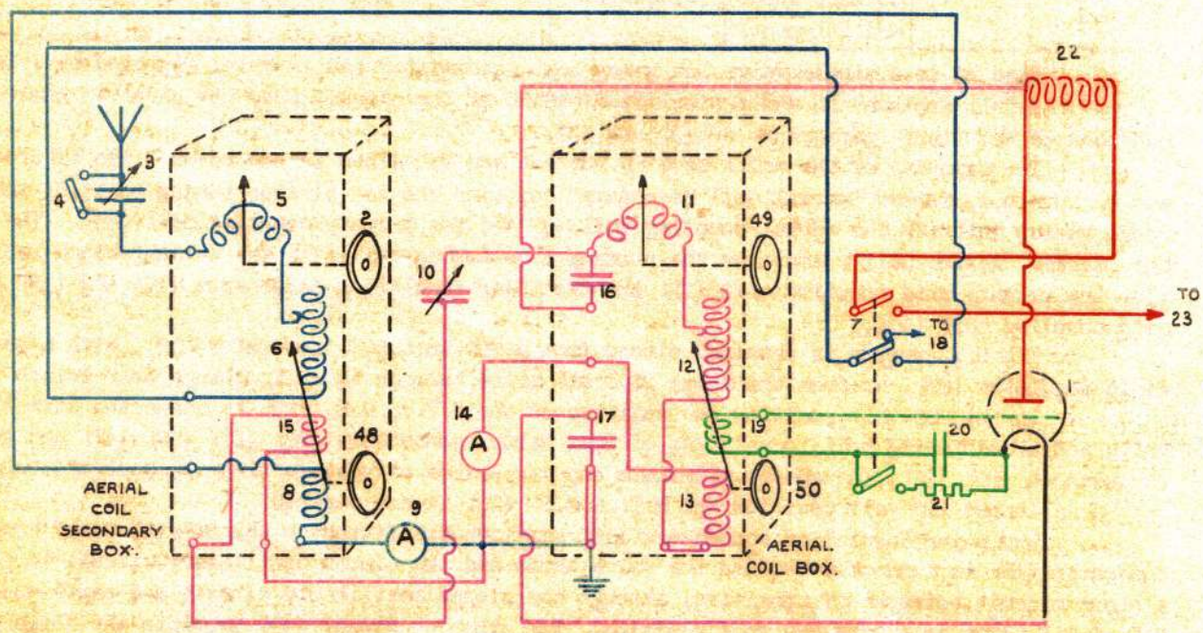

FIG. C.

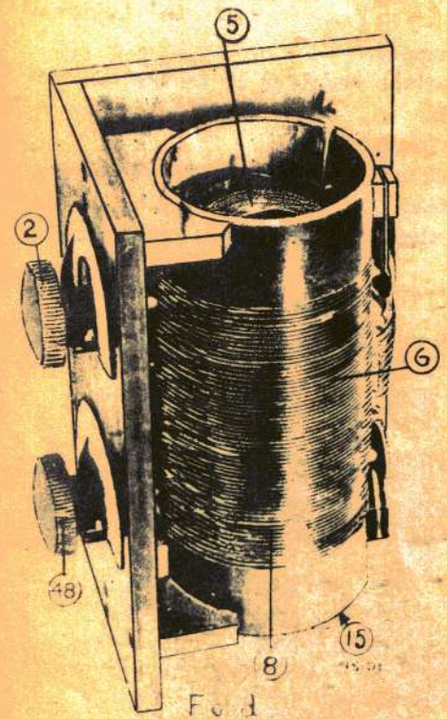

Fig d

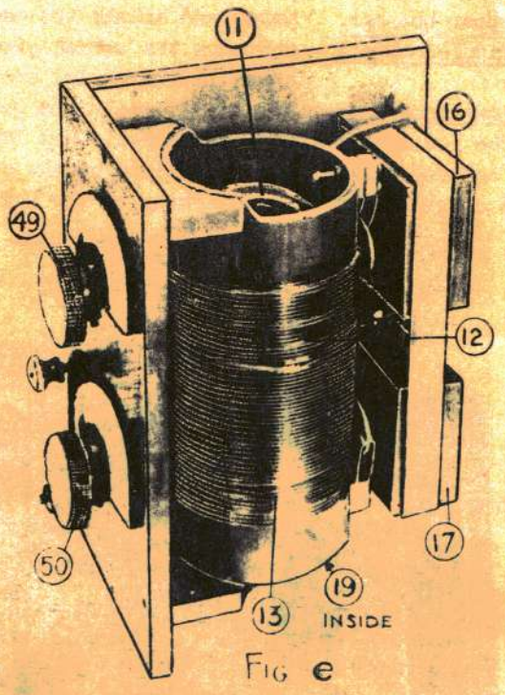

FIG e

The transmitting instruments and receiver, Model L.B. (see page H2) are fitted inside the receiving cabinet and there is sufficient coupling between the transmitter and receiver to enable the operator to listen in when the magnetic key is operated. In order to keep the aerial circuit on the same frequency when the magnetic key is made or broken a variable inductance (18) is connected between the receive contact of the magnetic key and the receiver to compensate for the connecting leads and the aerial coupling coil (8) which are only in circuit when the magnetic key is made.

Tuning. Two methods can be used to tune the transmitter and the receiver.

(a) By using a wavemeter.

When tuning with a wavemeter the coupling coil of the wavemeter is placed close to the "Aerial Coil" box to tune the primary circuit. The aerial coupling (48) is turned to zero and the grid coupling (50) set to a suitable position to maintain oscillations in the primary circuit. Adjustments are then made on the primary rough tuning coil (12) and the primary fine tuning coil (11) with the tuning condenser (10) set approximately to the middle of the scale. The final tuning can then be made on the primary tuning condenser (10).

The grid coupling should not be altered after the primary circuit is correctly tuned as this may affect the tuning.

The wavemeter coupling coil is then removed and the aerial circuit adjusted to the frequency of the primary circuit. The aerial circuit is coupled to the primary by setting the aerial coupling (48) to about 15 degrees. Adjustments are then made on the aerial rough tuning coil (8) and fine tuning coil (5) until a maximum reading in the aerial ammeter (9) indicates that the aerial circuit is in tune with the primary circuit.

The receiver can be tuned to the frequency of the primary circuit by adjusting the tuning condenser of the model LB to the "dead space" of the transmitted wave.

(b) By "Master Ship" tuning.

When using this method the set is tuned by adjusting the receiver to another ship's transmitted wave and then tuning the transmitter to the adjustment of the receiver. The receiver, Model LB, is first tuned to the frequency of the "master ship's" transmitted wave and the adjustment for the "dead space" on the receiver tuning condenser carefully noted. The transmitting set is then switched on and the magnetic key (7) made by the morse key. As Model LB is an autodyne receiver the frequency of the primary circuit of the transmitter can then be adjusted to the "dead space" of the receiver. The coupling in the Model LB must be kept at a minimum.

Type 31 is normally only required to transmit on one of two frequencies which are known as the "Divisional" and "Subdivisional" waves. The set, including the aerial system, is tuned by one of the above methods to the divisional and subdivisional waves and the adjustments noted. The aerial circuit is then adjusted to a frequency approximately midway between the two waves and is not altered when changing over from one frequency to the other.

In all cases it is important that the aerial coupling (48) and grid coupling (50) are always kept as loose as possible.

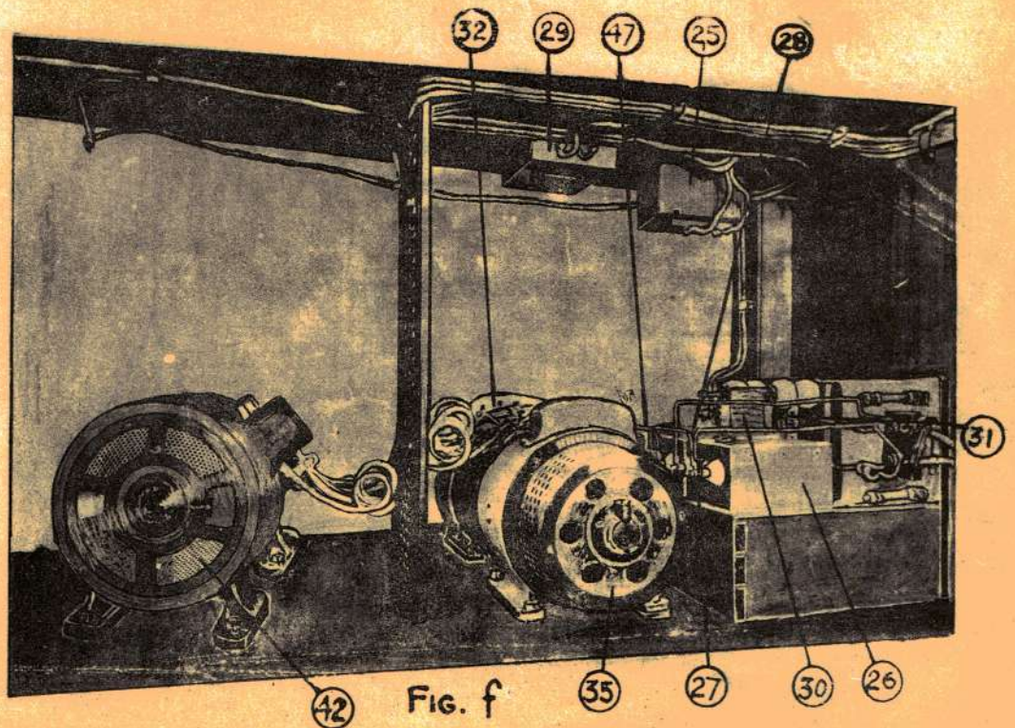

FIG. f