SECTION O

TRANSMITTERS 5 AND 6

SUB-SECTION OA H/F ATTACHMENTS

(OTHER THAN PANELS)

TRANSMITTER	5C	PAGE OA2
"	5D	" OA4

SUB-SECTION OB TRANSMITTERS 6

TRANSMITTER	6D	PAGE OB2
"	6E	" OB3
"	6F	" OB4
"	6G	" OB6

TRANSMITTER 5C.

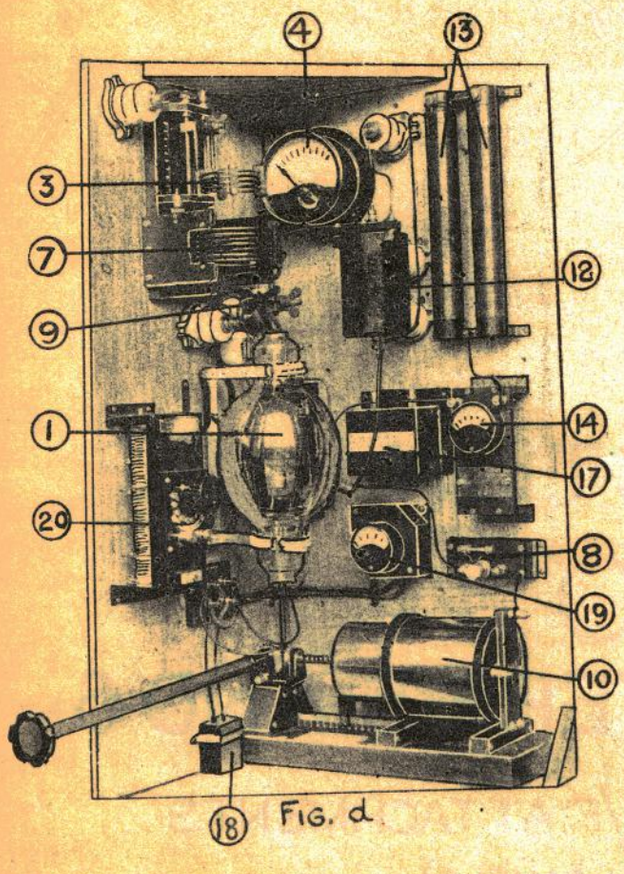

Fig. d.

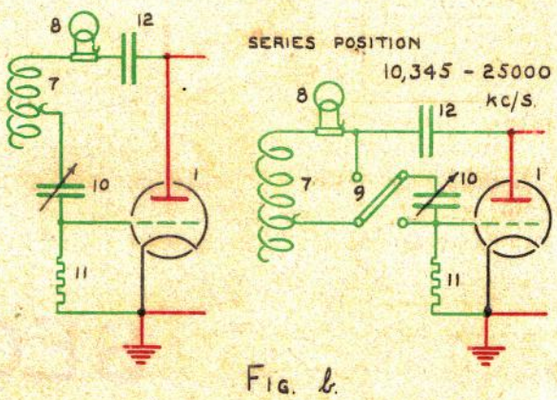

Fig. b.

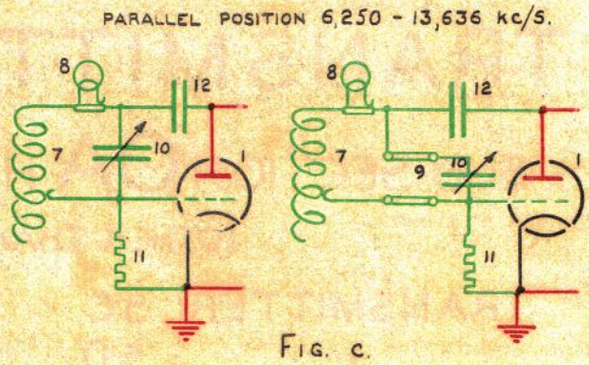

Fig. c.

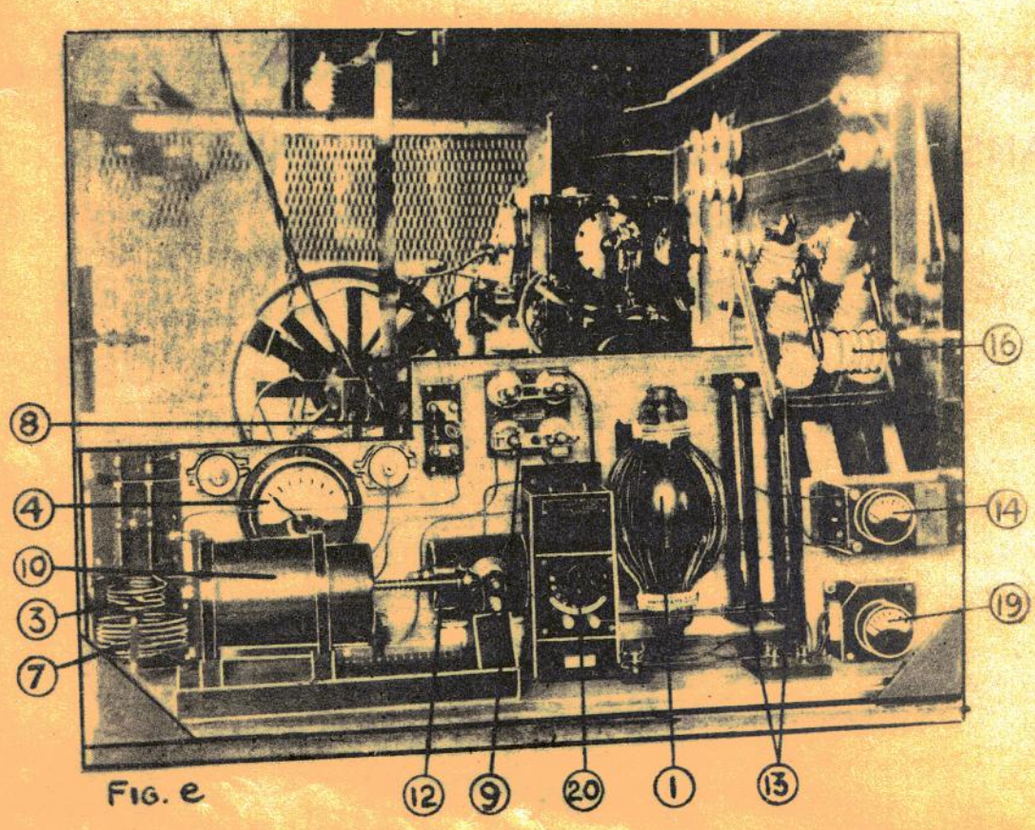

Fig. e

TRANSMITTER 5C. OA3.

Date of design:- 1929.
Frequency range:- 3250 - 25,000 kc/s.
Power supply:- 1½ kW. Rotary converter.
Valves used:- One NT4A
Associated wavemeters.- G7 and G8.

Note:- In some cases the frequency range of this set has been extended by local modification to include 4290 kc/s.

Wave form.	Method of producing oscillation.	Nature of circuit.	Grid excitation.	Feed.	Aerial excitation.	High oscillating potential electrode.
I.C.W.	Self.	Tuned circuit between anode and grid.	Direct capacitive.	Parallel.	Mutual inductive.	Anode.

Reference:- Admiralty Handbook of W/T (1931) paragraph 712.

Transmitter 5C is the H/F attachment fitted with Type 2 or Type 4 from which the power supply is obtained. Figure d. shows the arrangement of the instruments when the set is fitted in conjunction with Type 4 and figure e. shows the arrangement for Type 2.

The H.T. supply from the main transformer (30) is connected to the H/F set by the H.T. change over switch (16). The centre point of the transformer secondary is earthed and completes the circuit for the D.C. component of the anode current. Only one half of the transformer secondary therefore is used. The frequency of the I.C.W. note produced is very gruff owing to the low frequency of the A.C. supply from the rotary converter to the transformer, i.e., about 70 cycles/sec.

The filament supply is obtained from the 21 volt D.C. generator (22) with two fuses (21) in the circuit to protect the generator armature from a short circuit if an accidental earth develops on the positive side of the filament. A rheostat (20) and voltmeter (19) are used to adjust the filament voltage to the correct value.

The oscillatory circuit consists of the adjustable inductance coil (7) variable condenser (10) 4 volt pea lamp and shunt (8) and series parallel links (9). To obtain the range of frequencies desired the inductance coil (7) and condenser (10) can be connected in series or parallel with the interelectrode capacity of the valve by two links (9). The equivalent circuits and arrangement of links are shown in figures b. and c. The blocking condenser (12) prevents the H.T. supply being connected to the grid of the valve when the links (9) are used in the parallel position a shunt and pea lamp (8) are used to indicate that the circuit is oscillating. The set is coupled to the main aerial by the aerial coupling coil (3) the coupling being adjusted by sliding the coupling coil nearer to or further from the inductance coil (7). When using a small aerial it is sometimes preferable to tune the aerial to the transmitted frequency on a harmonic by connecting a variable condenser (5) in series with the aerial circuit. A link (6) short circuits the condenser (5) when using an untuned aerial. H/F transmission and reception are carried out on the same aerial, change over of the aerial from send to receive being effected by the send-receive switch (2).

Tuning. The set is tuned by coupling the wavemeter to the inductance coil (7), the series-parallel links (9) being connected in the appropriate position for the frequency required. A coarse adjustment is obtained by varying the tapping on the inductance coil (7) and a fine adjustment by means of the variable condenser (10). The aerial if of suitable length can then be tuned by condenser (5), and the aerial coupling should then be adjusted until maximum aerial current - and minimum glow in pea lamp (8) - are obtained. Coupling must then be slightly loosened to avoid instability of wave frequency, the latter being finally checked by wave-meter. The shunt is provided for pea lamp (8) so that it can be adjusted to burn at about half brilliancy.

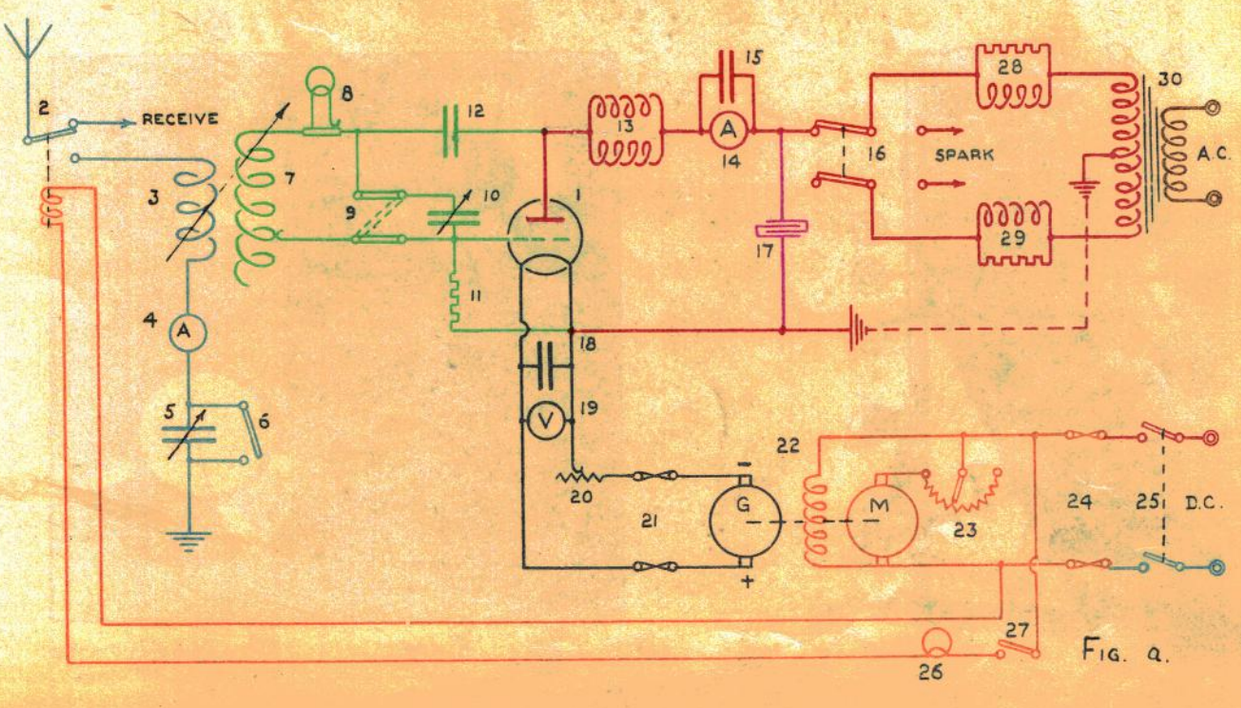

FIG. a.

TRANSMITTER 5D.

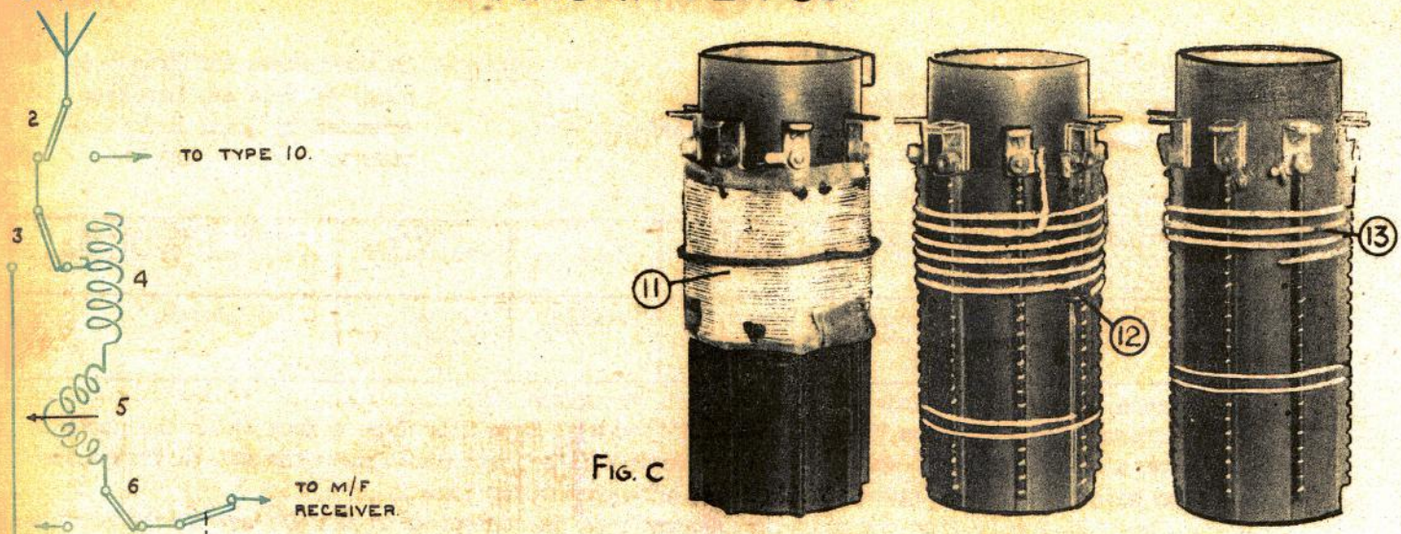

FIG. C

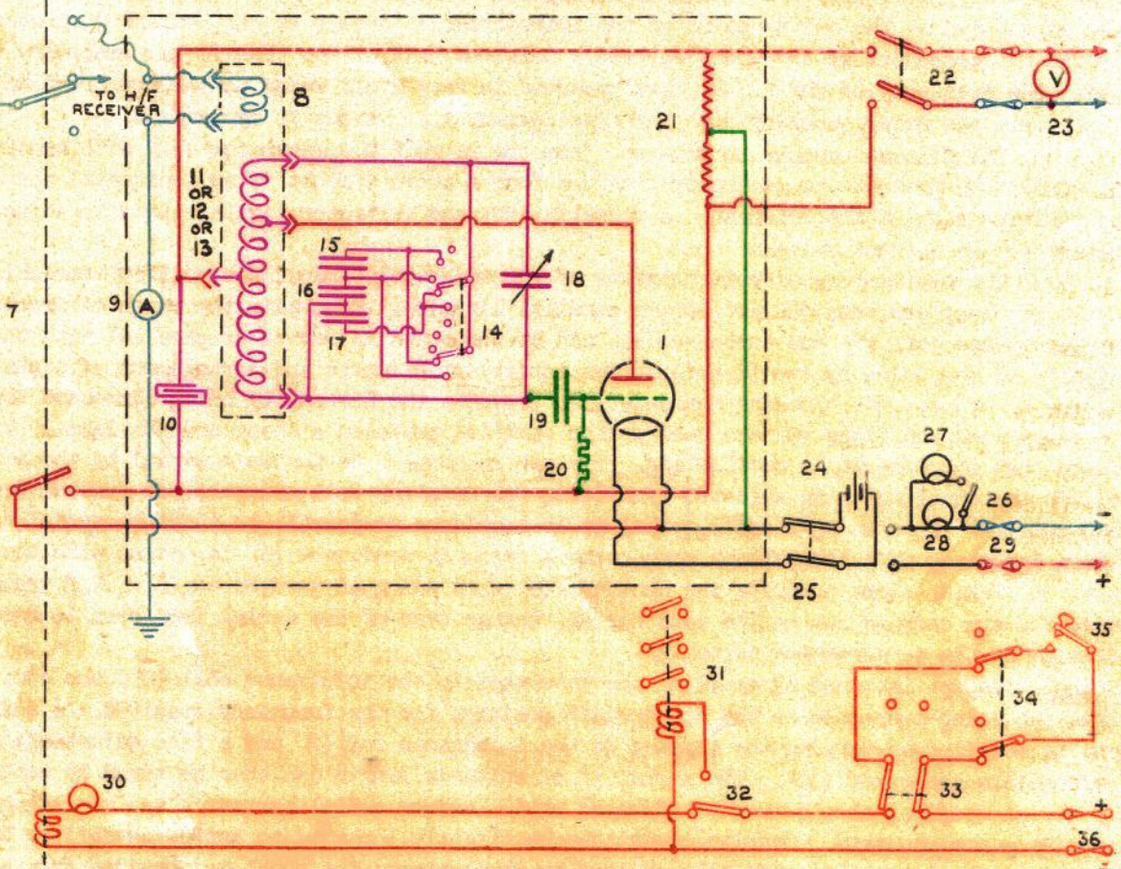

FIG. a.

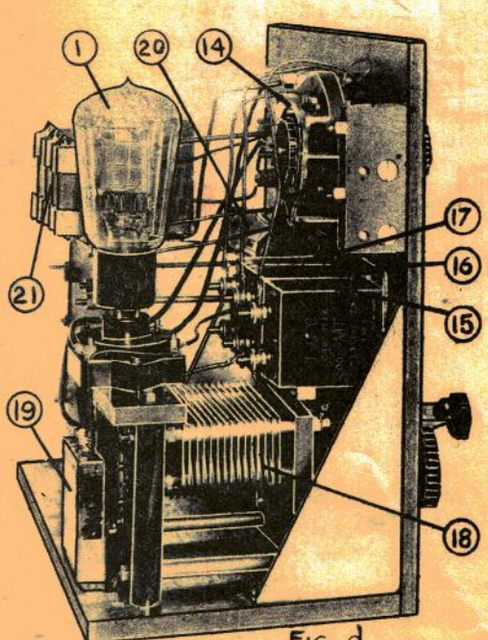

FIG. d

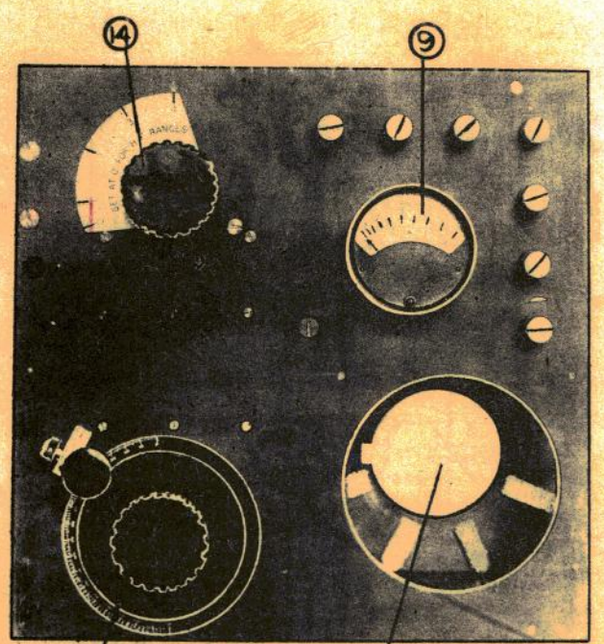

FIG. e

TRANSMITTER 5D. 0A5.

Date of design:- 1930.
Frequency range:- M/F 100 - 200 kc/s.
H/F 4000 - 12000 kc/s.
Power supply:- Type 14 Motor booster.
Valves used:- One NT17.
Associated wavemeters:- Pattern 1492B or G9, G7 and G8.

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 grid.	Direct inductive.	Series.	Mutual inductive.	Anode.

Reference:- Admiralty Handbook of W/T (1931) paragraph 626.

Transmitter 5D is an attachment fitted in conjunction with Type 14 from which the power supply is obtained. The set can be used for short distance communication (about 5 miles) on the M/F range but its principal function is to transmit on the H/F range when the deck insulator is too wet to permit the use of the Type 14 arc set.

The H.T. supply from the motor booster is connected to the set by the H.T. switch (22) and care should be taken that the voltage does not exceed 350 volts or the valve may be damaged.

The 4 volt filament supply is obtained from a secondary battery (24) which can be charged from the D.C. mains through resistance lamps (27) and (28). A switch (26) connects one lamp (27) in parallel with the other lamp (28) for regulating the charging rate.

Three plug in coils are provided for the oscillatory circuit. One coil (11) is used for the M/F range and three fixed condensers (15)(16)(17) can be used with this coil and are switched in paxallel with the variable condenser (18) in four positions as shown in figure b.

Two interchangeable coils (12)(13) are supplied for the H/F range but the additional fixed condensers (15) (16)(17) must not be used with the H/F circuit.

Grid signalling is used and is carried out in the following manner. The valve filament negative is connected to the centre point of a potentiometer resistance (21) across the H.T. supply. The valve grid is connected to the H.T. negative through the grid leak resistance (20). A negative potential equal to half the H.T. supply is therefore applied to the grid and prevents the valve oscillating. The lower contact of the magnetic key (7)short circuits the potentiometer resistance between grid and filament when the key is pressed, thus greatly reducing the negative potential on the grid and allowing the valve to oscillate.

As the same aerial is used for M/F and H/F transmission and reception it is necessary, when using H/F, to disconnect the Type 14 aerial circuit to prevent a large capacity to earth being left connected to the H/F circuit. This is done by connecting the upper contact of the magnetic key (7) to the Type 14 aerial circuit for use with M/F and the middle contact direct to the aerial change over link (3) for use with H/F. The lead between the aerial coupling coil (8) and the magnetic key (7) must be connected to the appropriate terminal on the magnetic key (7) when changing from M/F to H/F and vice versa.

A change-over switch (32) connects the circuits for the morse key (35) either to the bobbin of the magnetic key (7) for the 5D Transmitter or to the magnetic key (31) for the Type 14 set.

The aerial coupling coil (8) is intended to preserve a loose coupling over all frequencies and when using H/F the aerial ammeter should show a small reading although the aerial is untuned.

Tuning. The set is tuned separately to the M/F and H/F ranges as follows:-

M/F range. Connect the lead for the coupling coil (8) to the upper contact of the magnetic key (7). Couple the wavemeter to the M/F tuning coil (11), switch in the fixed condensers, if necessary, and make the final adjustment on the variable tuning condenser (18). The Type 14 aerial circuit is then adjusted until the maximum reading is obtained in the aerial ammeter (9).

H/F range. Connect the lead for the coupling coil (8) to the middle contact of the magnetic key (7). Couple the wavemeter to the H/F tuning coil (12) or (13) and adjust the variable tuning condenser(18) to the desired frequency. The aerial circuit is untuned but if the aerial has a natural frequency corresponding with the transmitted frequency the aerial current will be comparatively large. If the aerial current rises to 0.5 amp or more the aerial coupling must be further reduced by removing a few inches of the aerial coupling coil or the transmitted frequency will become very unstable.

FIG. b.