SUB-SECTION OB TRANSMITTERS

TRANSMITTER 6D

Date of design: 1929.
Frequency range:- 66 - 666 kc/s.
Power supply:- 20 volt battery.
Associated wavemeters:- Pattern 1492B or 69.
Approximate distance range:- 40 miles.
Type of circuit:- Spark transmitter.

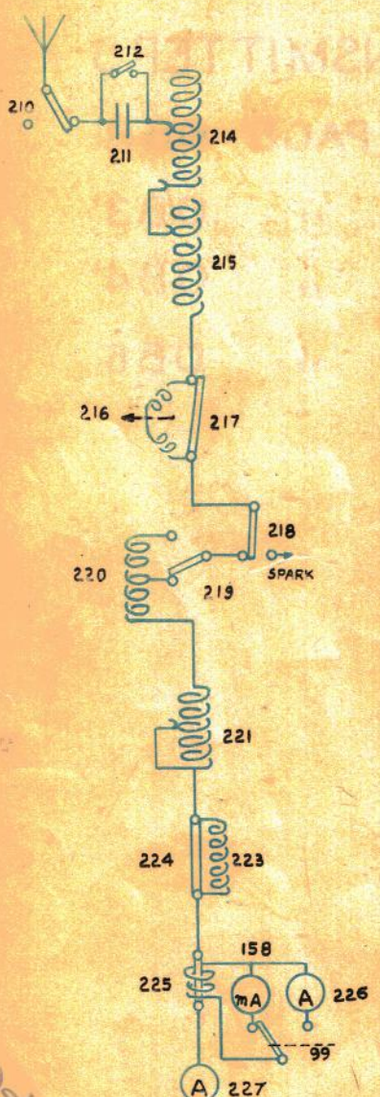
Transmitter 6D uses the same aerial and is fitted as part of Type 36 (see Section R) for use as an emergency set when power from the ships mains fails thus putting the other transmitters in the main office out of action. The transmitter is entirely operated by the 20 volt battery supply from the Board 2G Charging.

The 20 volt supply is taken through a tumbler switch (414) in the Central Receiving Room to the 10 volt bobbin of the send-receive switch (402) which has a 40 ohm resistance(401) in series to reduce the voltage to 10 volts. The tumbler switch (414) also supplies 20 volts to the morse key (413) which is connected in series with the primary of the induction coil (403), see Admiralty Handbook of W/T (1931) paragraph 430. The send-receive switch (402) connects the aerial either to the operating switch (228) of the main set or to the coupling coil (411) of the Transmitter 6D. A catch on the link (415) prevents the send-receive(402) being accidentally switched to "SEND" and earthing the aerial through the aerial coupling coil (411) and aerial ammeter (412) when the emergency set is not in use.

The primary circuit consists of two condensers (406)(407), which can be connected in series or parallel by the series-parallel switch(405); the main tuning coil (410), which is adjustable in 13 stops for rough tuning, the spark gap (404), the variometer (408) which is used for fine tuning and primary coupling coil (409).

Tuning. The set is tuned by coupling the wavemeter to the tuning coil(410), with the condenser switch (405) in the appropriate position, and setting the switch on the tuning coil (410) to the required adjustment. The variometer(408) is used for fine tuning. Coupling between the aerial and primary circuits is adjustable and should be set to the loosest possible coupling while the primary circuit is being tuned. After tuning the primary circuit the aerial should be connected and the aerial coupling adjusted to give the maximum reading in the aerial ammeter (412).

It should be noted that when the aerial is connected to the transmitter 6D by the send-receive switch (402) the tuning of the main aerial circuit will be altered slightly owing to the addition of the inductance of the aerial coupling coil (411).



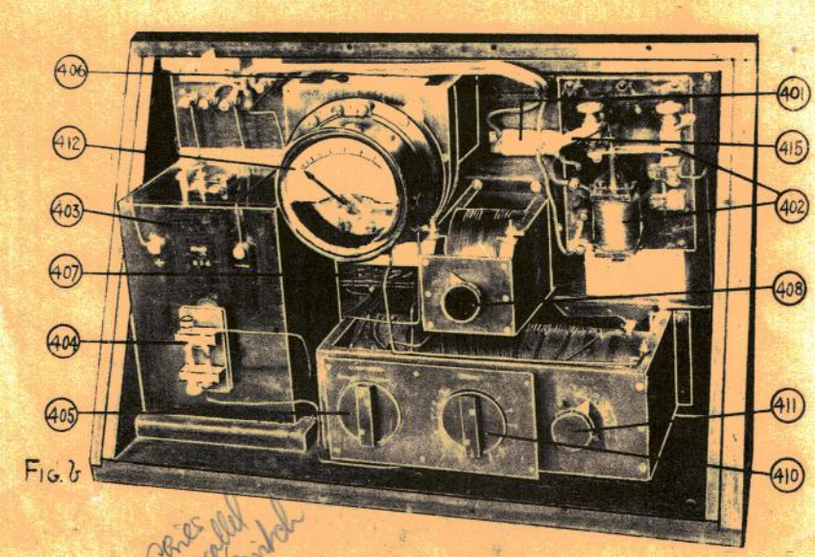


FIG. b

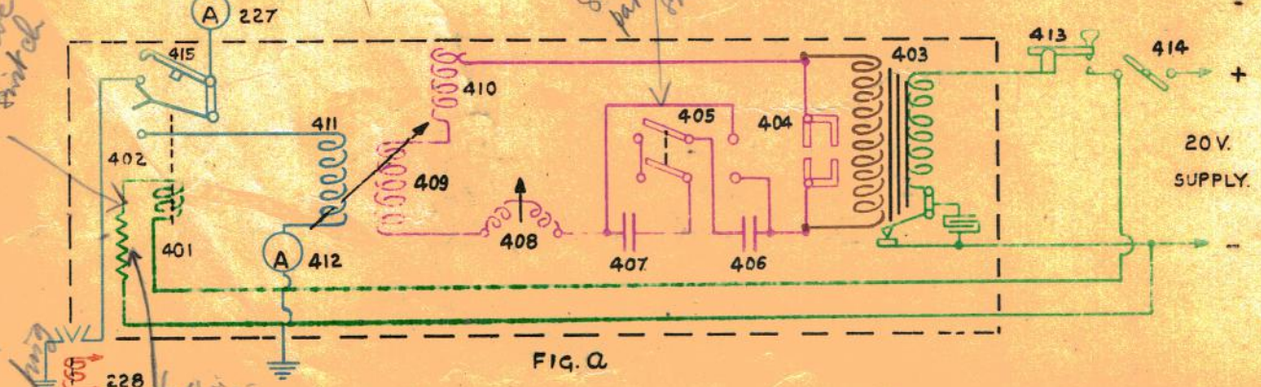


FIG. a

TRANSMITTER 6E

Date of design:- 1929.
Frequency range:- 1765 - 2500 kc/s.
Power supply:- 20 volt battery.
Associated wavemeters:- Patt. 1492B or G9.
Approximate distance range:- 10 miles.
Type of circuit:- Spark transmitter.

Transmitter 6E uses the same aerial and is fitted as part of Type 43 (See Section R)for use as an emergency set when power from the ship's mains fails, thus putting Transmitter 4G out of action.

The transmitter is entirely operated by the 20 volt battery supply from Board 2F Charging if fitted in an office which contains Type 43 only and from Board 2G Charging if fitted in an Auxiliary Office with other W/T sets in addition to Type 43.

The 20 volt supply is taken through a tumbler switch (414) in the receiving cabinet to the 10 volt bobbin of the send-receive switch (402) which has a 40 ohm resistance (401) in series to reduce the voltage to 10 volts. The tumbler switch (414) also supplies 20 volts to the morse key (413) which is in series with the primary of the induction coil (403) See Admiralty Handbook of W/T (1931) paragraph 430. The send-receive switch (402) connects the aerial either to the aerial terminals of Transmitter 4G or to the coupling coil (411) of Transmitter 6E. A catch on the link (415) prevents the send-receive switch (402) being accidentally switched to "SEND" and earthing the aerial through the aerial coupling coil (411) and aerial ammeter (412) when the emergency set is not in use.

The primary circuit consists of the tuning coil (410) condenser (406) and spark gap(404).

Tuning. The set is tuned by coupling the wavemeter to the tuning coil (410) and moving the tapping to the required adjustment. Coupling between the aerial and primary circuits is adjustable and should be set to the loosest possible coupling while the primary circuit is being tuned. The coupling should then be adjusted to give the maximum reading in the aerial ammeter (412).

When tuning it will be found necessary to use different adjustments on the aerial coil (5) for Transmitters 4G and 6E owing to the aerial tuning condenser which is fitted in series with the aerial circuit in 4G but is not in circuit when using 6E.

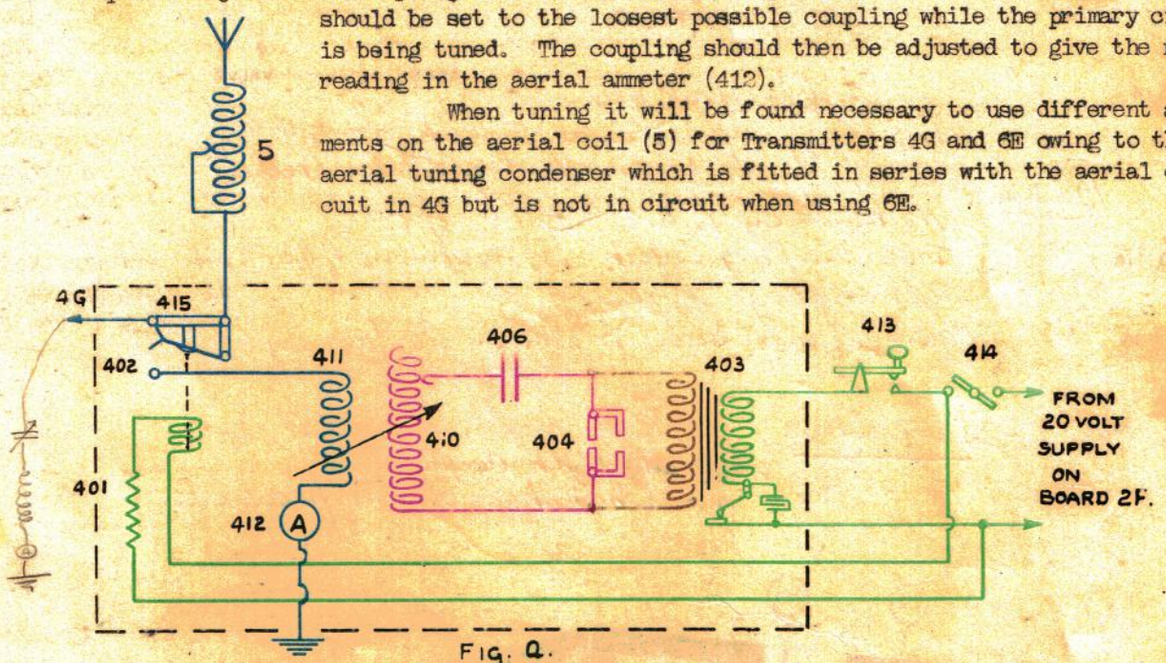


FIG. Q.

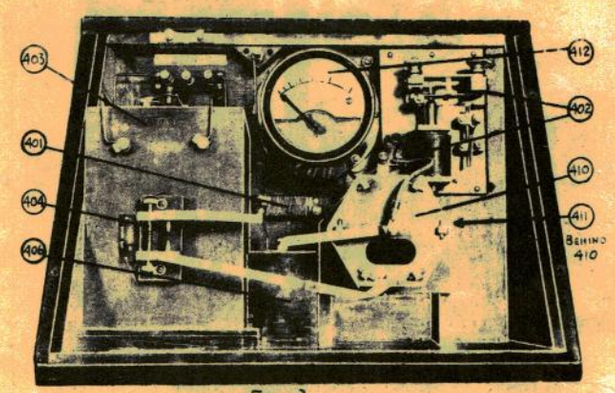


FIG 7

TRANSMITTER 6F

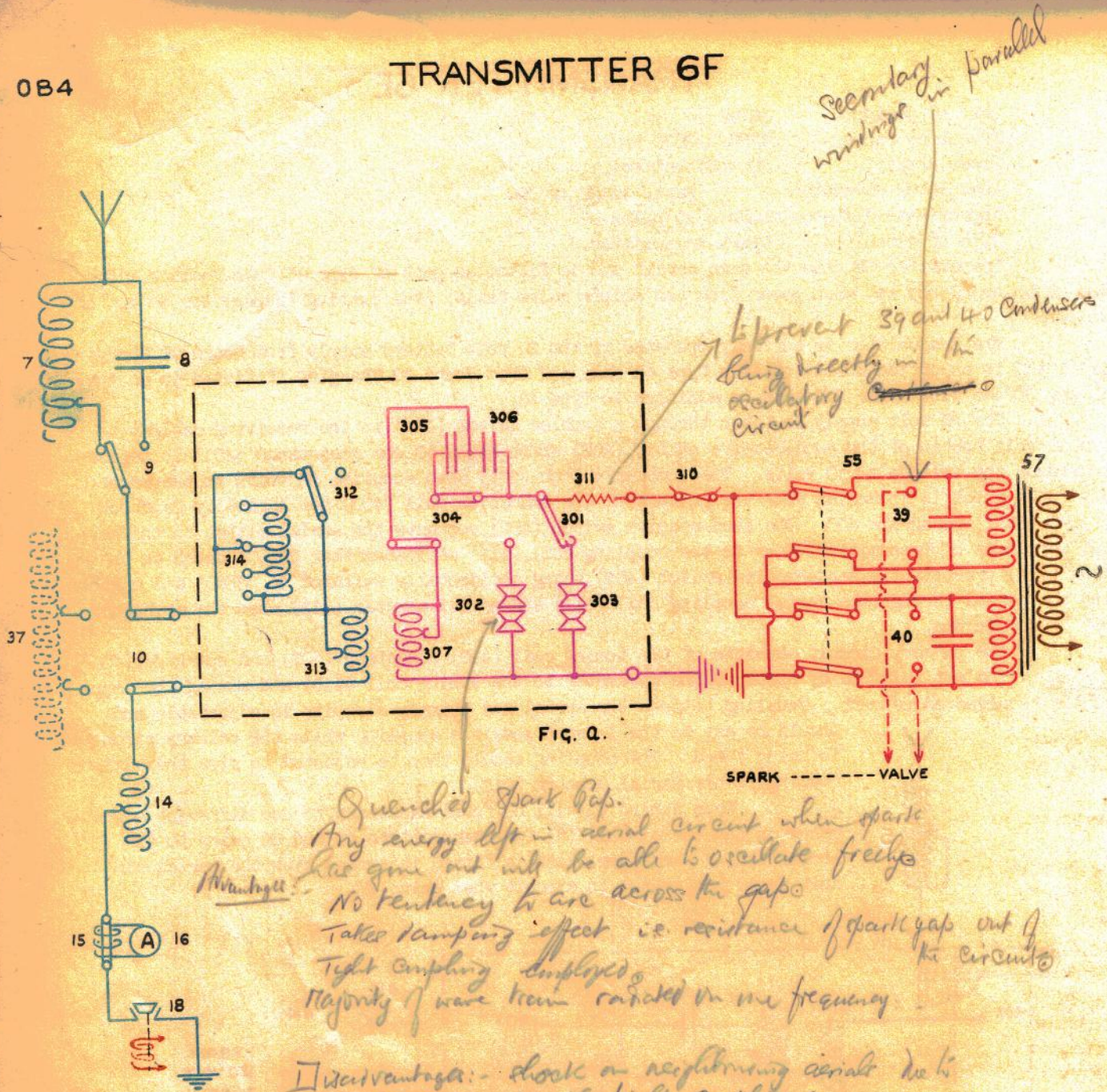


FIG. Q.

Quenched Spark Gap.
Any energy left in aerial circuit when sparks has gone out will be able to oscillate freely

Advantages:-
No tendency to arc across the gap.
Takes damping effect i.e. resistance of spark gap out of the circuit.
Tight coupling employed.
Majority of wave train radiated on one frequency.

Disadvantages:- Shock on neighbouring aerials due to excessively tight coupling.
Initial radiation on two frequencies.

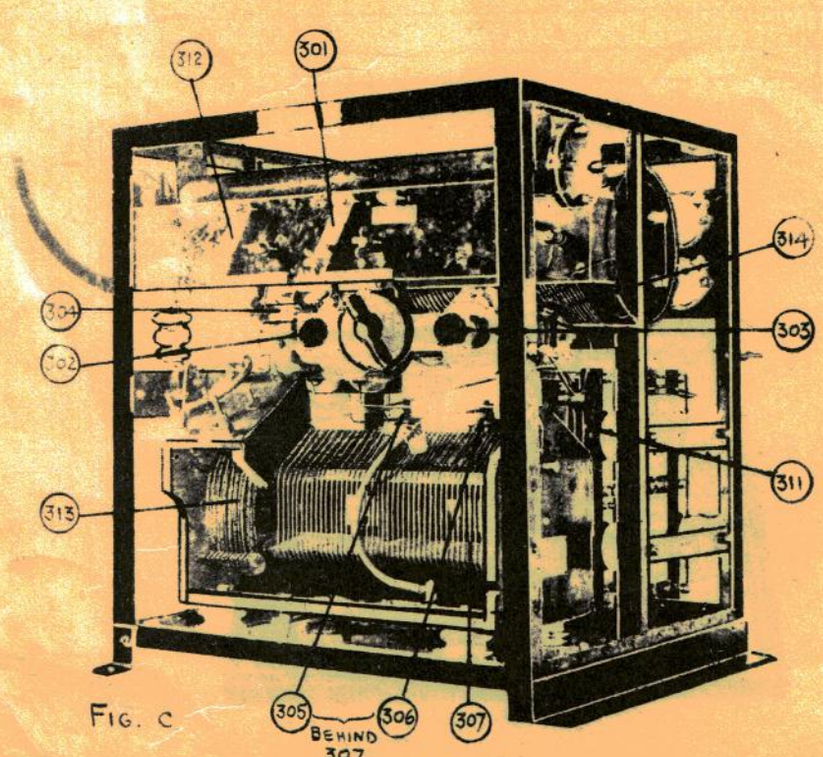


FIG. C

TRANSMITTER 6F

Date of design:- 1930.
Frequency range:- 100 - 900 kc/s.
Power supply:- Type 37 or 38.
Associated wavemeters:- Pattern 1492B or G9.
Approximate distance range:- 100 Miles.
Type of circuit:- Spark transmitter.

Note:- ~~The identity numbers agree with those used in Types 37 and 38 (See Section R).~~
Transmitter 6F uses the same aerial and is fitted as an attachment to Types 37 and 38. 49.
The primary use of the transmitter is:-

(a) to dry out the deck insulator if weather conditions are such that the valve set will not oscillate
(b) as a stand-by transmitter in the event of a complete breakdown of the valves or essential components of the valve set.

The transmitter obtains its supply from the main transformer, with secondary windings in parallel as shown in figure a. A horn fuse (310) and a 600 ohm resistance (311) are connected in the H.T. lead. The resistance (311) is inserted to prevent the protecting condensers (39) (40) across the transformer secondary windings from acting as components of the primary oscillatory circuit.

The primary circuit consists of one of two ½ kW. quenched spark gaps (302) (303), the primary condensers (305) (306) and an adjustable primary coil (307). A blower is used to cool the spark gaps and must always be made when the set is in use. The quenched spark gap is dealt with in the Admiralty Handbook of W/T (1931) paragraph 454, but figure 222 does not illustrate the exact type of gap used in 6F.

Links are used for connecting the condensers (305) and (306) to give 5, 10 or 20 jars. The arrangement of the links is shown in Admiralty Handbook of W/T (1931) paragraph 182 figure 57, and in figure b. herein.

The aerial circuit is connected to the spark set by two links (10) fitted at the rear of the valve panels.

In the "VALVE" position the links connect the tapping coil (37) in the aerial circuit. In the "SPARK" position the tapping coil (37) is disconnected and the tuning coil (314) and aerial coupling coil (313) connected in the aerial circuit for the spark transmitter. The 1000 mic. tuning coil (314) has tappings at 100, 200 and 300 mics and is used as an aerial tuning coil instead of the tapping coil (37) when in the "SPARK" position. The tuning coil (314) is not required for frequencies between 140 and 600 kc/s. and can be short circuited by the tuning coil link (312).

Tuning. The primary circuit is tuned with reduced power and the aerial links (10) removed. The condenser links (304) are set to the appropriate position and the wavemeter coupled to the primary tuning coil (307). Adjustments are made on the tuning coil (307) to obtain the correct tuning for the required frequencies.

The aerial circuit is then connected to the transmitter by the aerial links (10) and adjustments made on the aerial coupling coil (313) and tuning coil (314) to obtain the required frequencies.

The fine tuning coil (14) of the main set can be used for fine tuning the aerial circuit of the spark set if necessary.

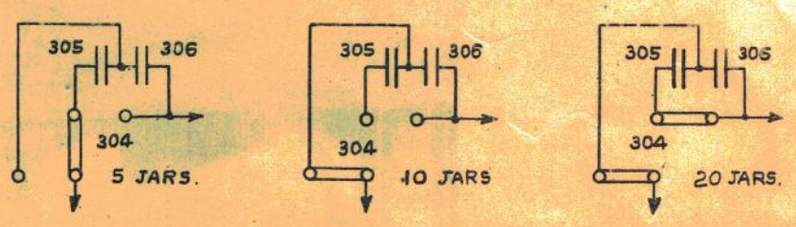


FIG. B.

1 Change over links.
2. " Series parallel switch.

OB6

TRANSMITTER 6G

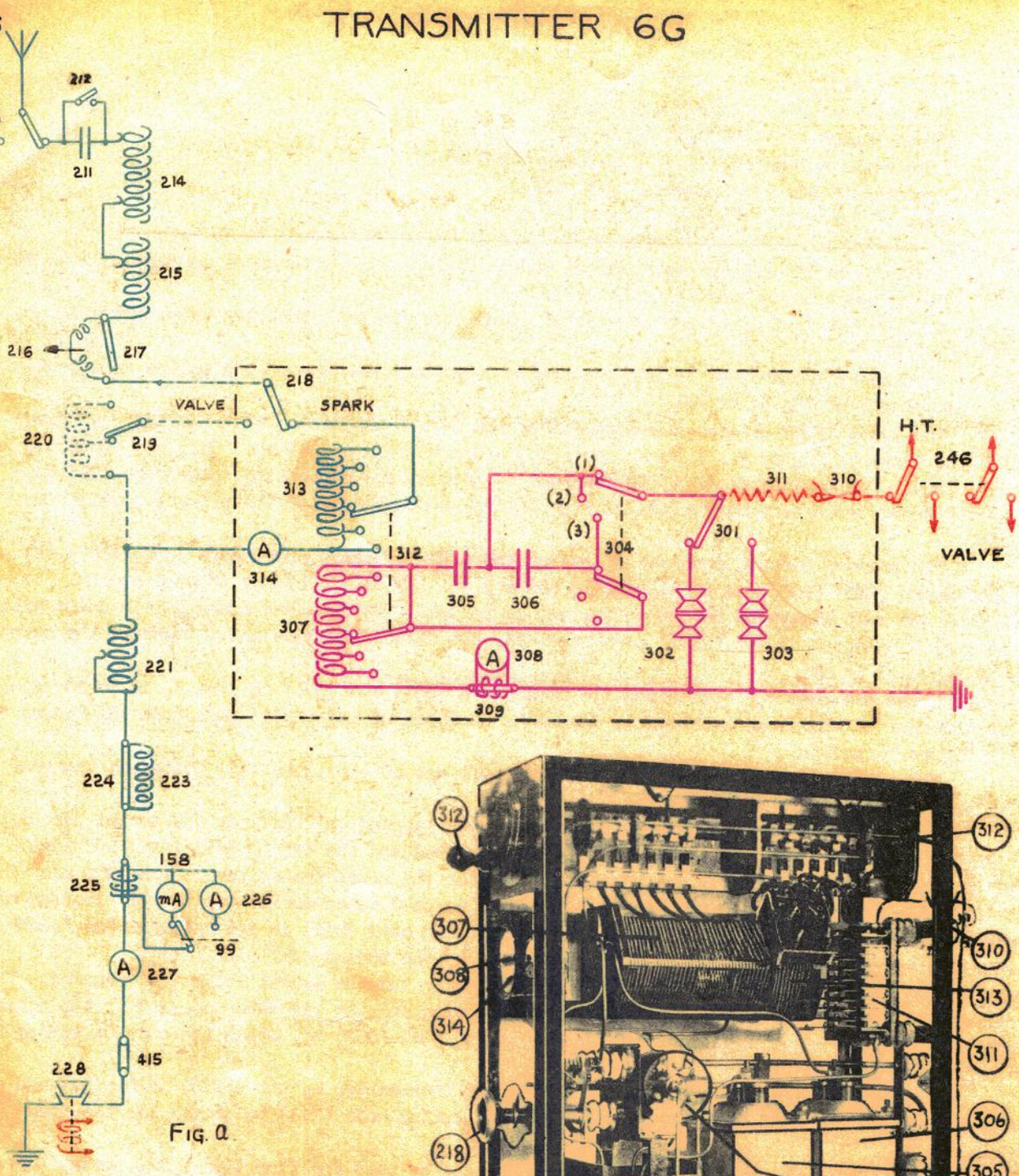


FIG. a

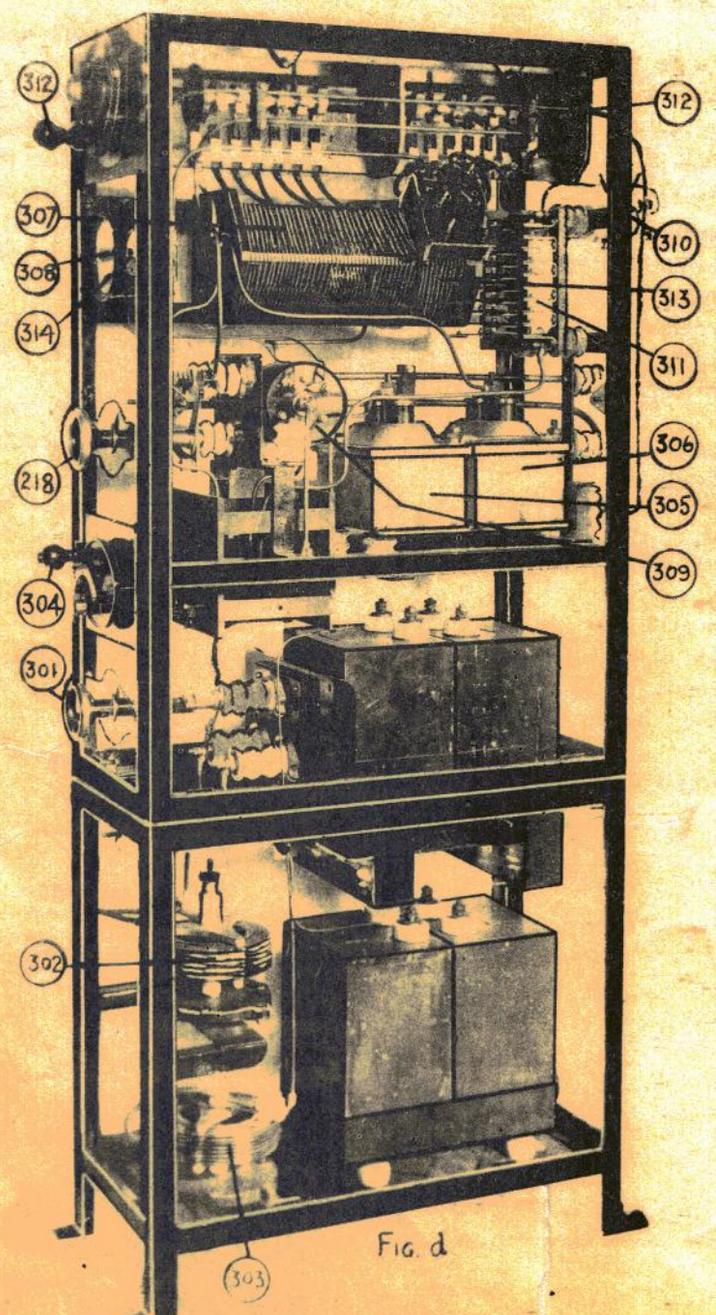


FIG. d

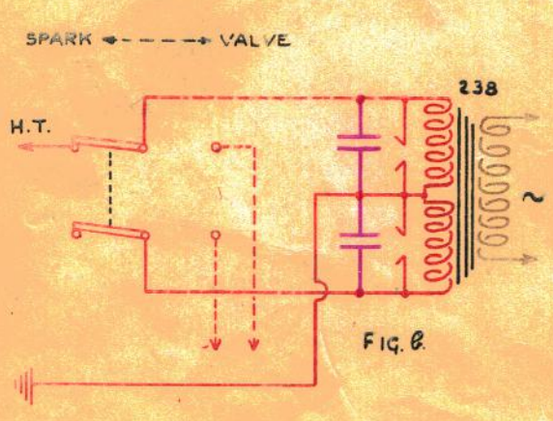


FIG. e

TRANSMITTER 6G

Date of design:- 1930.
Frequency range:- 66 - 666 kc/s.
Power supply:- Type 36.
Associated wavemeters:- Pattern 1492B or G9.
Approximate distance range:- 250 miles (Type 36) 150 miles (Type 35).
Type of circuit:- Spark transmitter.
References:- Section R (Types 35 and 36). Admiralty Handbook of W/T (1931) paragraph 454.

Transmitter 6G uses the same aerial and is fitted as an attachment to Types 35 and 36.

The primary use of the transmitter is

(a) to dry out the deck insulator if weather conditions are such that the valve set will not oscillate,

(b) as a stand-by transmitter in the event of a complete breakdown of the valves or essential components of the valve set.

When Transmitter 6G is fitted with Type 36 the panel which originally contained the main set smoothing condensers is modified to contain four smaller size condensers for the smoothing unit and the 6G in addition.

When fitted with Type 35 the whole transmitter is installed in a separate panel.

When fitted with Type 36 the transmitter obtains its supply from the main transformers (with secondaries in parallel) a switch (246) changing the H.T. lead from the valve to the spark set, (See figure c.) For reduced power, or in case of breakdown, one transformer can be used with the secondary switch in the parallel position but the switches to the transformer primary and secondary not in use must be broken.

When fitted with Type 35 the transmitter is connected to the transformer, (only one of which is fitted to the main set) by the valve - spark switch (246). (See figure b.)

The H.T. supply from the transformers is connected to the set through a horn fuse (310) and a 600 ohm resistance (311). The resistance (311) prevents the protecting condensers across the transformer secondary windings from acting as components of the primary oscillatory circuit.

The primary circuit consists of one of two 1½ kW quench spark gaps (302) (303), with a change over switch (301), two 20 jar condensers (305) (306) which may be connected in three positions by the C.O.S. (304) an adjustable primary coil (307) and an ammeter transformer (309). Cooling fins on the spark gaps prevent overheating and a blower is not required. See Admiralty Handbook of W/T (1931) paragraph 454. The condenser switch (304) connects the condensers in the following three positions:-

Position	Connections	Capacity in use
1	Two condensers in parallel.	40 jars.
2	One condenser.	20 jars.
3	Two condensers in series.	10 jars.

The primary coil (307) and aerial coupling coil (313) have six tappings which are varied together by the "spark frequency discharge switch" (312). A dial on the front of the panel, indicates the position of the spark frequency switch (312).

The aerial coupling coil (313) is mounted in a fixed position but as the number of turns in use in the aerial coupling coil (313) and primary coil (307) are varied together suitable coupling is maintained at each position of the "spark frequency discharge switch"(312). The Type 35 or 36 aerial circuit is connected to the aerial coupling coil (313) by the aerial valve - spark switch (218), the handle of which is mounted on the front of the transmitter panel.

Tuning. The primary circuit is tuned with reduced power and the aerial valve-spark switch (218) broken. The condenser switch (304) is set to the appropriate position and the wavemeter coupled to the tuning coil (307). The connections between the six stops on the "spark frequency discharge switch" (312) and the primary coil (307) are then adjusted to give the correct tuning for the six frequencies required.

The aerial circuit is then connected to the transmitter by the aerial valve-spark switch (218) which disconnects the aerial coupling coil (220) of the valve set when the spark set is used.

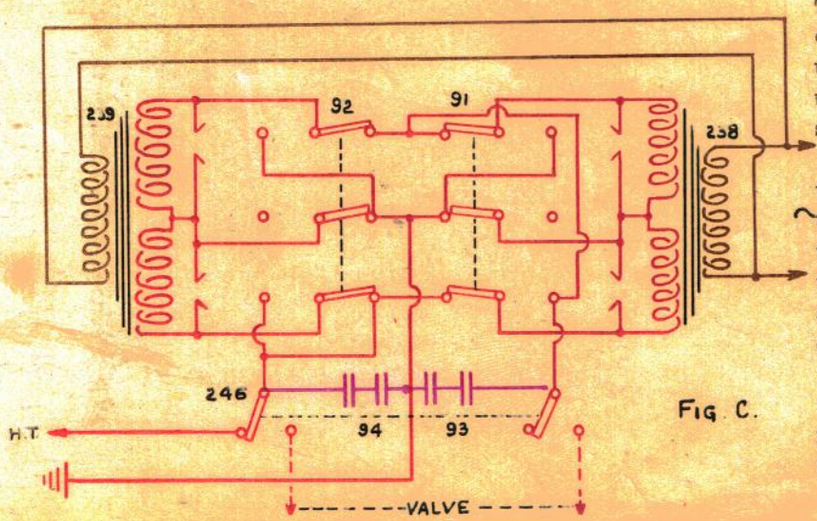


FIG C.

The adjustments used in the aerial circuit for the valve set are also used with the spark transmitter with the exception of the valve set aerial coupling coil (220).

The connections between the six stops on the spark frequency discharge switch(312) and the aerial coupling coil (313)are then adjusted tc give the correct aerial tuning for the six frequencies to which the primary circuit is tuned. Correct tuning of the aerial circuit is indicated by the maximum reading in the aerial ammeter (314).