

# TYPE 707

XB7

Date of design:- 1921.

This is a Sound Telegraphy receiving set, which is replacing Type 706\* in modern vessels. In principle it is the same as Type 706\* consisting essentially of a pair of Mark IV or Mark V or Tank hydrophones (1)(2) (see page XA2) connected in series with telephones (16) and batteries (11) (12) but the arrangement and operation of the circuit are somewhat different. No "tuned" circuit is fitted.

The main controlling position is in the chart house and remote control is fitted in the D/F office for "R/A position finding" as for Type 706\* but in this case the set can actually be controlled (i.e.; change-over from one hydrophone to the other) from the D/F office. A two-pole two-way C.O.S. (pattern 1549)(3) enables either the chart house or D/F office to control.

The control is carried out by two separate single-pole switches (4)(5) and (6)(7). When both switches are in the off position, both hydrophones are supplied with current through the warming coil (8). The movement of one switch (4)(5) or (6)(7) connects its hydrophone to the telephone circuit leaving the other hydrophone on the 200-ohm warming coil (8). The effect of leaving the unwanted hydrophone with a warming current flowing through it is to keep the latter in a sensitive condition ready for instant use, since the carbon granules are thus prevented from packing. A variable series 300-ohm resistance (9) is fitted to enable the reception to be made less sensitive in order to reduce the effect of extraneous noises, although, of course, also reducing the strength of the desired signal.

A milliammeter (10) is fitted, but is only single-reading and is mainly for testing purposes.

The batteries (11)(12) consist of pattern 1551B secondary cells (see page NA2) and are fitted in duplicate with the usual charge-discharge switch (13)(14) with a 16 c.p. resistance lamp (15) to enable the batteries to be charged from the ship's mains.

The hydrophones (1)(2) consist of a thin diaphragm with an ivory adaptor on its inner side which carries a small carbon granule microphone. The microphone should be fitted as nearly vertical as possible for efficient operation. In order to get the required depth it is necessary in many cases to seat the hydrophone in a position where the hull is inclined at a considerable angle. The adaptor is arranged to give the microphone diaphragm an inclination of  $45^{\circ}$  to the hydrophone diaphragm. By rotating the adaptor on the boss of the hydrophone diaphragm the microphone can be given any inclination to the vertical between the limits plus and minus 45 degrees to the inclination of the hydrophone diaphragm.

The microphone and diaphragm are extremely delicate and must be carefully handled.

## Care and Maintenance.

The following tests should be carried out:-

- (a) On fitting and on all occasions of dry docking the diaphragm should be cleaned with petrol and then given a thin coating of red lead mixed with gold size. Great care must be taken not to scratch it.
- (b) Insulation test for electrical circuits. Disconnect all leads from battery, and the flexible cable from the hydrophones. Test each lead in turn for insulation resistance, which should be greater than one megohm.

Note:- It is extremely important to avoid putting the megger across the microphone, which would ruin the latter. To test the insulation of the flexible leads to the hydrophone the outer ends must be connected together and then tested. If only one is connected and an earth develops on the other, the microphone will be placed across the megger. The megger should be turned slowly at first during this test, when an earth will immediately be apparent. If no sign of an earth appears the megger voltage may be increased and the true resistance obtained.

- (c) Continuity test of electrical circuits. Continuity is denoted by the milliammeter reading when a hydrophone switch is made. The current indicated should rise steadily as the series resistance is cut out. If it does not do so, test for continuity with a megger, first disconnecting the microphone at the terminal box and shorting the terminals.

The resistance when the circuit is as above and with all series resistances in, and one hydrophone switch made, should be about 350 ohms, decreasing about 30 ohms as each step of resistance is cut out.

The above test should be a daily one. A rough test when setting watch can be made by making and breaking the hydrophone circuit, when a click should be heard.

- (d) The microphone is liable to become insensitive owing to the granules "packing" or sticking together due to damp air in the microphone chamber. This should be eliminated by gently tapping the microphone case or hydrophone carcass together with the use of the warming circuit.

Crackling noises may be due to packing or to a loose connection. If the microphone or adaptor are not firmly secured or if electric leads lie across the microphone, insensitivity will result.

Further information concerning care and maintenance will be found in A.F.O. 135/28 and

Handbook of Hydrophones - O.U. 3190.

Note:- The production of this set has been taken over by the Portland A/S School, but telegraphist ratings are responsible for its upkeep at sea. (vide A.F.O. 749/28).

XB6

# TYPE 707

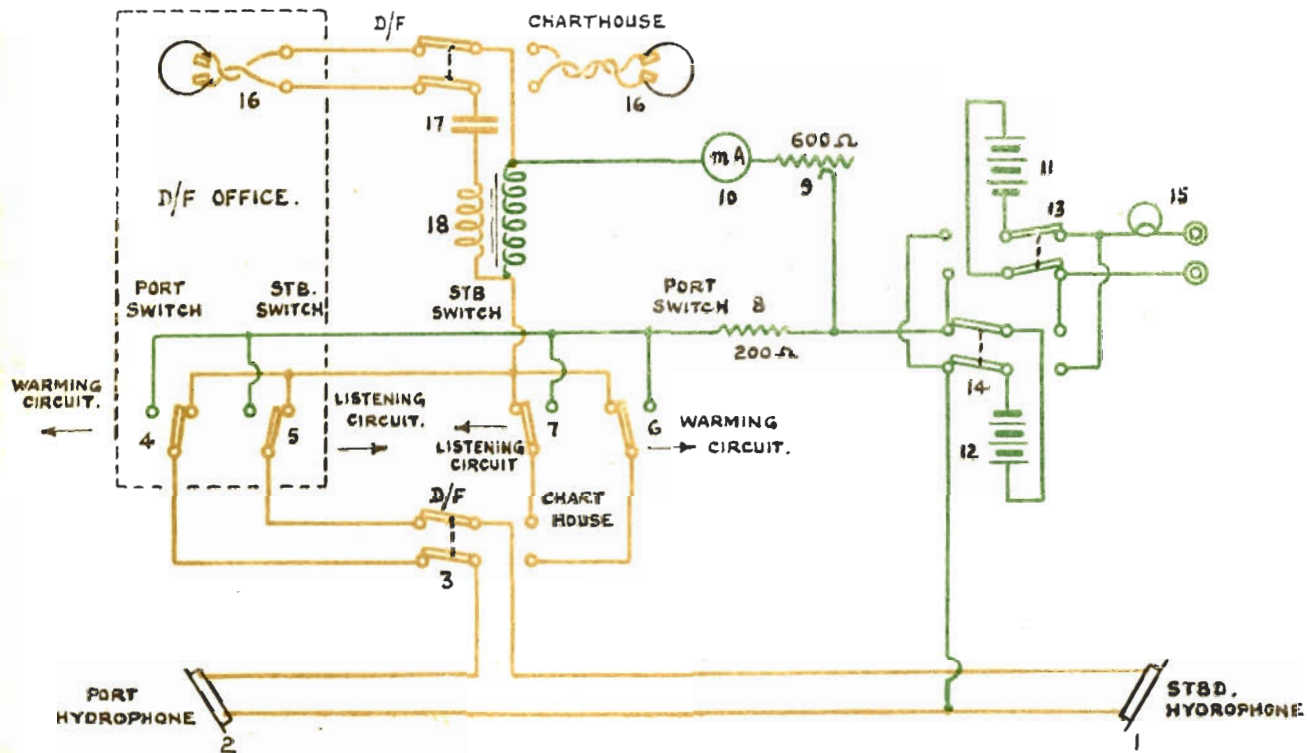


FIG. G.

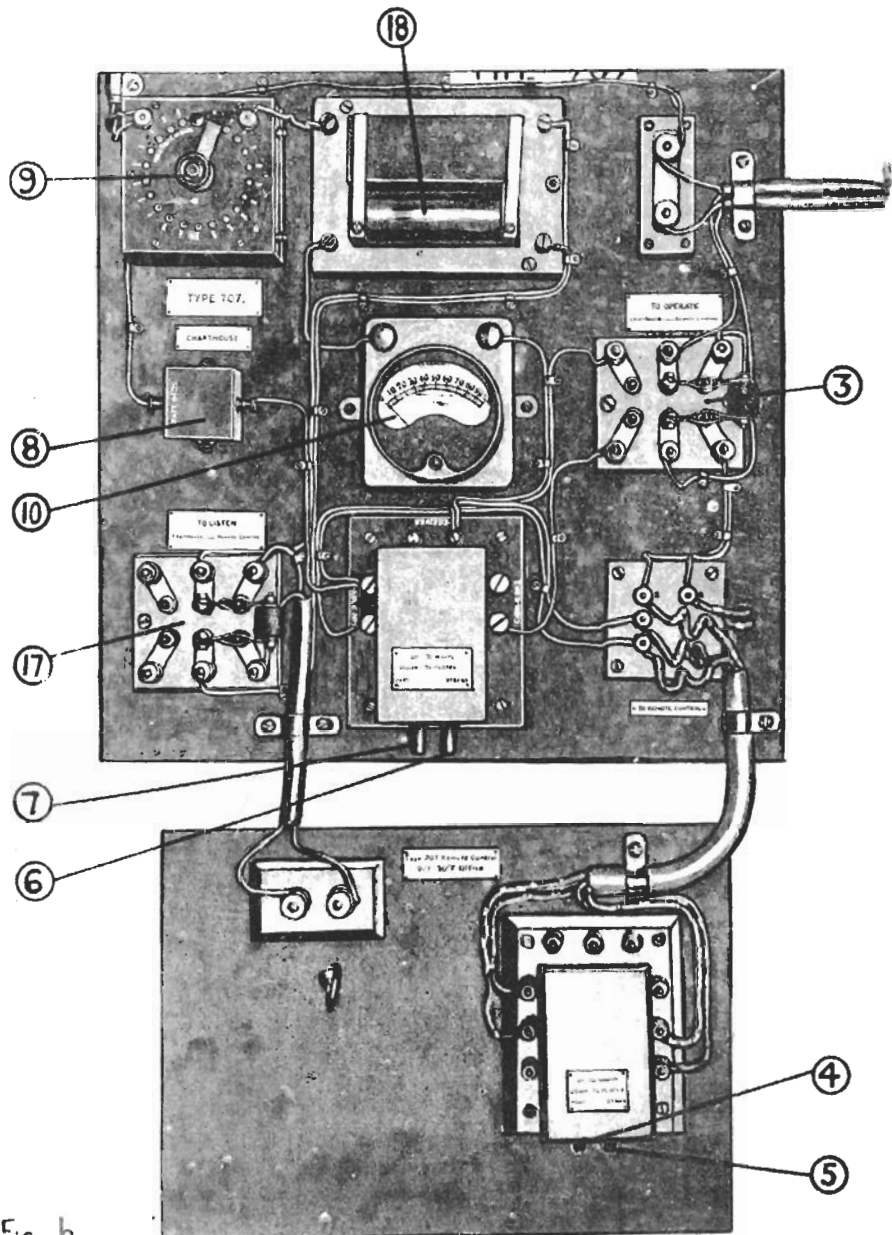


FIG. b