H.M. Signal S
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Portsmouth.
24th A[illegible] 1922.

RECEIVING APPARATUS IN H.M. NAVY.

This report consists of a general survey of the receiving apparatus in use in the Royal Navy.

The majority of the apparatus now in use was developed shortly after the advent of the three-electrode valve. It is considered that criticisms and ideas for future development can now be based upon more extensive knowledge and practical experience of the possibilities of this type of valve. This review will be given in the succeeding paragraphs, which deal in order with the aerial, the tuning unit, and the amplifier.

AERIALS AND TUNING CIRCUITS.

The aerials in use appear to be efficient and as any alterations would affect the Transmitting as well as the Receiving Section, it was decided not to proceed with any experiments for the time being.

Two tuning units are in common use, viz., Model C and Model E. The former is for long waves up to 8000 metres and the latter for short waves up to 240 metres. Both of these circuits are legacies of the days of crystal reception, but, although troublesome to adjust, both are reasonably efficient. The circuits are shown in Fig. 1 and Fig. 2. It will be seen that with Model C there are four tunings to be made and one coupling adjustment, and with Model E there are three

tunings

tunings and two coupling adjustments.

It is proposed to attack first the Model E problem and to attempt to make a tuning unit that will involve one tuning adjustment and one coupling adjustment. This will enable the whole apparatus to be used for "searching" for a signal, a practice which is well nigh impossible with the present service gear.

The circuit arrangements by which this will be done are shown in Fig. 3.

With Model C receiving gear it may not be possible to perform the same operations, but it is proposed to experiment with some modifications that will enable both a "search" and also a more accurate tuning of the component parts of this unit. This very accurate tuning is essential for reception with the rejector, which only becomes an efficient anti-jamming device if the three parts of the aerial circuit are very accurately tuned.

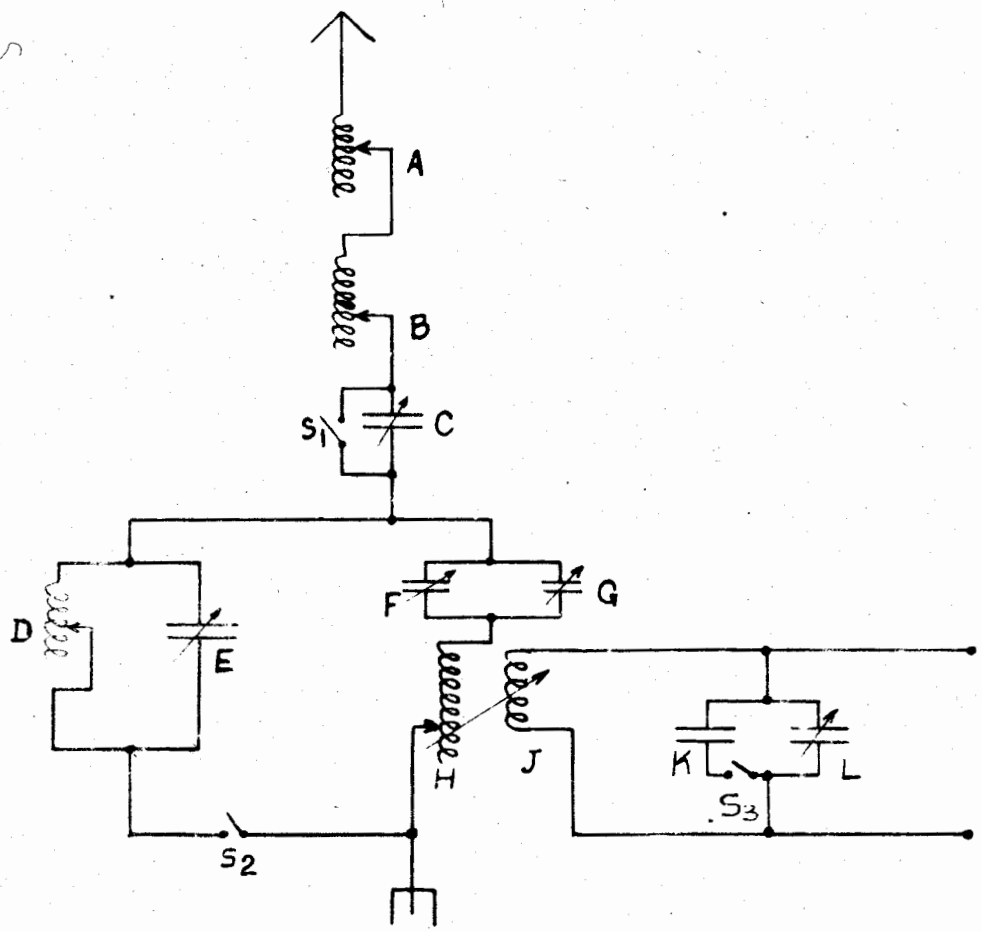
The modification of the Type C circuit is shown in Fig. 4.

The aerial part A B C can be tuned by closing keys K_2, K_1a. By opening K_2 the part D E F can be tuned, and finally by making K_1b the third circuit can be tuned.

In this way all circuits can be tuned to the incoming wave exactly.

If the present method of tuning by reference to a previous calibration is used, the above methods can be utilised. If the tuning has been thus accomplished, by the use of the switches the tuning of the various parts can be made more exact and the efficiency of the whole increased. The rejector can then be tuned to minimise interference.

MODEL C RECEIVING CIRCUIT



A INDUCTANCE AERIAL No.5, 10000 MICS.

B INDUCTANCE TUNER No 1, 5320 MICS.

C CONDENSER No. 7 .95 JAR.

D INDUCTANCE ADJUSTABLE No.12, 5.5 MICS.

E CONDENSER No.14 3187 JARS.

F CONDENSER No.13 15.5 JARS.

G CONDENSER No. 7 0.95 JARS.

H INDUCTANCE TUNER MUTUAL No. 40, PRIMARY 1200 MICS.

J INDUCTANCE TUNER MUTUAL No. 40, SECONDARY 6600 MICS.

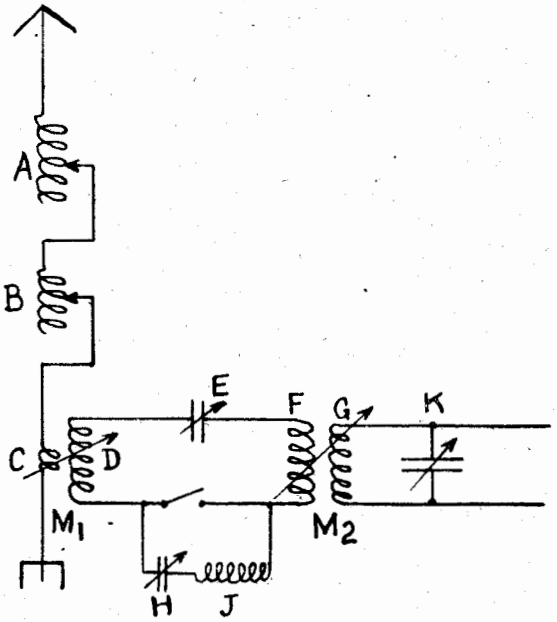
K CONDENSER No.8, 0.67 JARS.

L CONDENSER No. 7, 0.95 JARS.

S_2 REL SWITCH.

FIG. 1.

MODEL E RECEIVING CIRCUIT

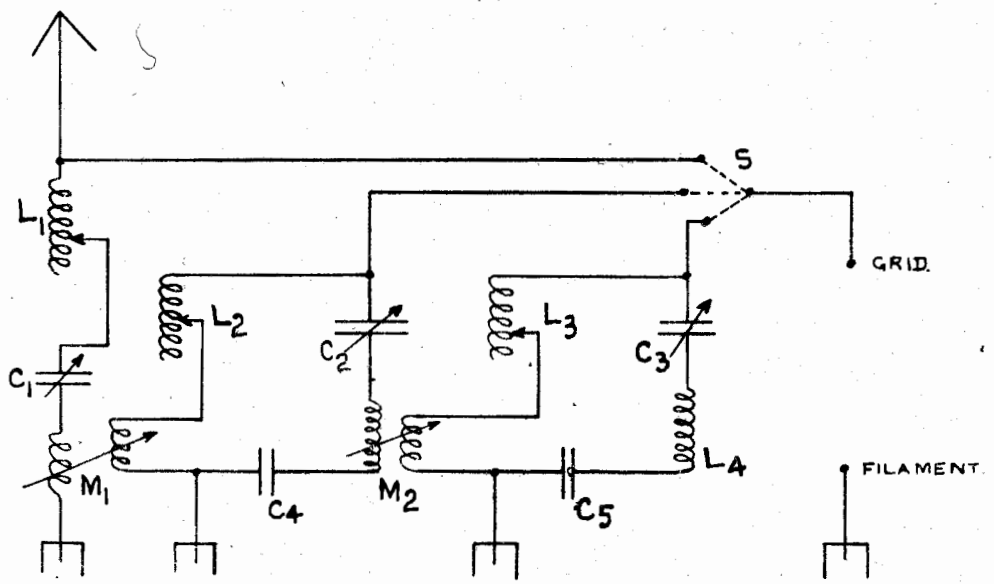


A	INDUCTANCE AERIAL (SMALL TUNER)	- 20 MICS.
B	INDUCTANCE No. 13.	- 6 MICS.
C	INDUCTANCE MUTUAL No. 34, PRIMARY	-.25 MICS.
D	INDUCTANCE MUTUAL No. 34, SECONDARY	-3.8 MICS
E	CONDENSER No. 7.	- 0.95 JARS.
F	INDUCTANCE MUTUAL No. 33, PRIMARY	- 20 MICS.
G	INDUCTANCE MUTUAL No. 33 SECONDARY	- 60 MICS.
H	CONDENSER No. 12.	- 0.24 JARS.
J	INDUCTANCE FIXED No. 22.	- 50 MICS.
K	CONDENSER No. 12.	- 24 JARS.
M_1		0 - .23 MICS
M_2		0.7 - 4.88 MICS

AERIAL INDUCTANCE 4 MICS, AERIAL CAPACITY .4 JAR.

FIG. 2.

SUGGESTED RECEIVING CIRCUIT IN LIEU OF MODEL E.



$L_1 = L_2 = L_3$ THREE INDUCTANCES VARIABLE TOGETHER.

$C_1 = C_2 = C_3$ THREE CAPACITIES VARIABLE TOGETHER.

$C_4 = C_5$ = AERIAL CAPACITY.

$M_1 = M_2$ TWO COUPLINGS VARIABLE TOGETHER.

M_1 SEC. = M_2 SEC. = AERIAL INDUCTANCE.

M_1 PRIM. = M_2 PRIM. = L_4

S = 3 WAY TUNING SWITCH.

FIG. 3.

MODEL "C" RECEIVING CIRCUIT.

(MODIFIED.)

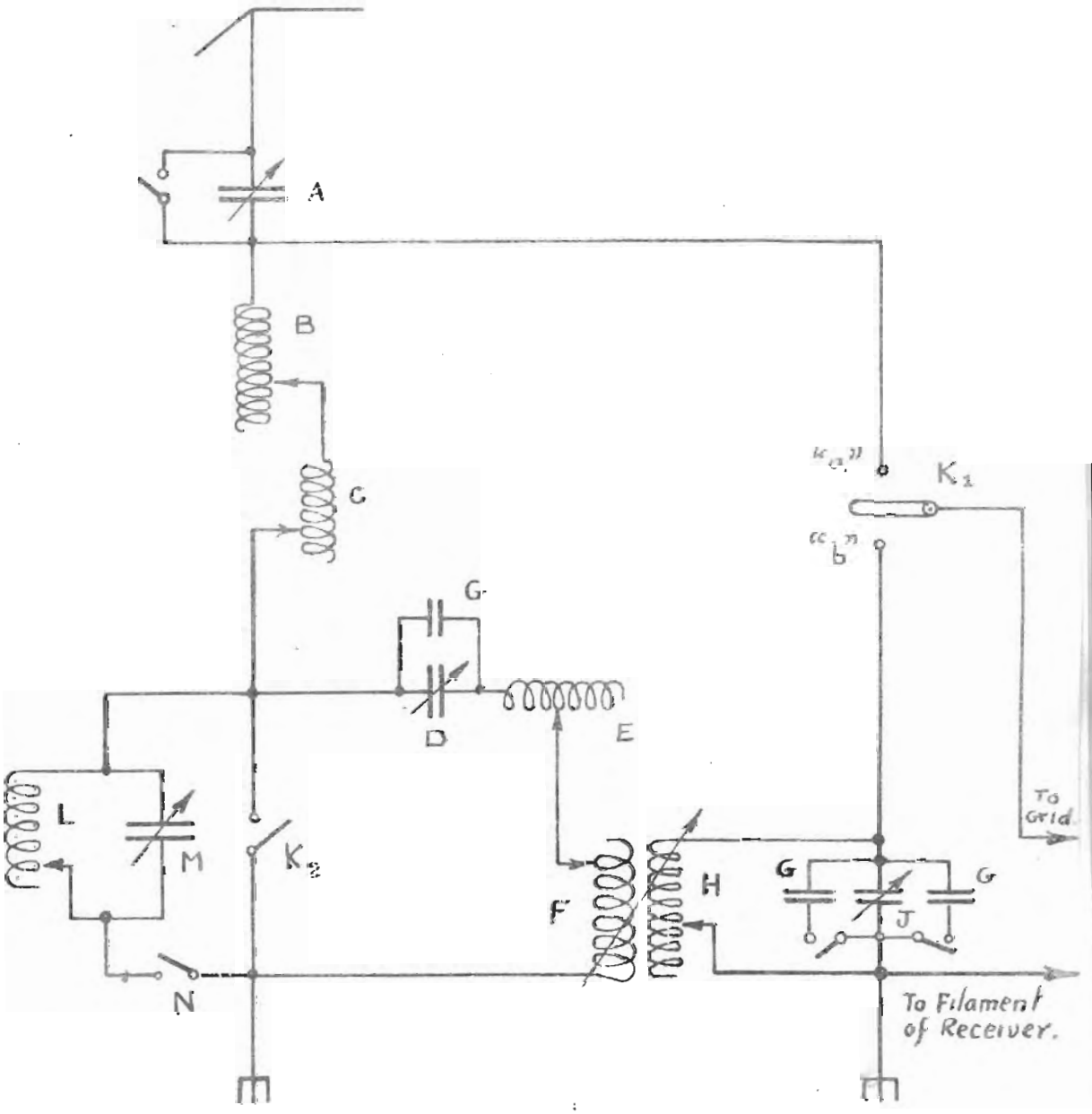


FIGURE 4.

REFERENCE.

A	CONDENSER, Nº 7.	G	CONDENSER Nº 8.
B	INDUCTANCE, AERIAL, Nº 5.	H	INDUCTANCE, TUNER, MUTUAL, Nº 41 SECONDARY
C	INDUCTANCE, AERIAL, Nº 1.	J	CONDENSER, Nº 7.
D	CONDENSER, Nº 7.	L	INDUCTANCE, ADJUSTABLE, Nº 12.
E	EXTRA INDUCTANCE.	M	CONDENSER Nº 14.
F	INDUCTANCE, TUNER, MUTUAL, Nº 41 PRIMARY.	N	"RED SWITCH" (for Rejector).