

## W.T. EQUIPMENT OF "EURYALUS" FOR MANŒUVRES, 1913.

During the 1913 manœuvres and for the second year in succession, the "Euryalus" wore the Flag of the Umpire-in-Chief; the following full description of her W/T equipment, for her special duties of interception, has been recorded with a view of assisting in the work of preparing any other large vessel for a similar purpose on future occasions.

Simultaneous reception on three different Wave-lengths was arranged for as follows:—

*Blue Fleet Aerial.*—The Ship's W/T Office was employed for the interception of Signals made by the Blue Fleet.

*Aerial.*—Double fourfold, fitted as follows:—

From 30 feet above Forecastle to Fore W/T Yard and extending to 50 feet abaft this Yard, the 50 feet extensions being tailed with 2-inch hemp outhauls, taken to the Main W/T Yard. Two fourfold feeders were run from the Deck Insulator abaft the After Bridge, through Insulators to clear stays, &c., to two 20-foot spars lashed to the spurs on either side of the Main Top. From these spars the Feeders were led forward, and connected to the after ends of the Aerial.

$$\lambda\sigma = 112 \quad \sigma = 1.84 \text{ Jars.}$$

*Transmitting Apparatus*—

(a) Service Mark I\*.

(b) Service 80 Volt Motor Buzzer Set, as supplied to Ships fitted with Mark II Installations.

As the range of (b) was somewhat limited, owing to the small value of the Transmitting Condensers (*i.e.*, 40 Jars), a special Transmitting Set was extemporised for (b), consisting of a No. 2 Receiving Condenser fitted with a single loop of 15 gauge wire, the diameter of the loop being 7 inches; the Condenser and Loop Inductance constituted an adjustable Primary Transmitting Circuit which was connected to the brush terminals of the Motor Buzzer.

The Mutual consisted of six turns of Patt. 611 wire wound three on each side of the Loop Inductance and supported in position by means of an Ebonite Former.

The tuning of the Primary Circuit was effected by plugging up different Condenser values. For "S" Wave a Condenser of 200 Jars was used. A large Condenser value in the Primary Circuit increases the Aerial current considerably. It was noticed, when tuning, that small variations in the tuning of the Primary had no effect on the Wave-Length transmitted by the Aerial, and only affected the value of the Aerial Current to a small extent; this rendered it unnecessary to ensure exact tuning of the Primary since only one Wave can be found on the Wave-Meter when the Primary and Secondary circuits are coupled.

*Receiving Apparatus.*—Ordinary Service "C" Type, including a Potentiometer.

*Red Fleet Office.*—A Silent Cabinet was erected by the Dockyard on the Port side of the After Superstructure, adjacent to the Main W.T. Office and just abreast of a small Signal House; a permanent canvas screen was erected round the Cabinet and entrance to the Signal House; a hinged door being fitted leading into the area thus enclosed. The Cabinet was lead lined, the lead being connected by earthing strips to the beams immediately overhead.

*Aerial.*—Double fourfold, extending from Main W/T Yard to stern. Twofold feeders were fitted one third from the bottom of the aerial and led to a Bradfield Insulator mounted in an ebonite disc and placed in a scuttle on the after side of the signal house referred to above.

$$\lambda\sigma = 22.8 \quad \sigma = 1 \text{ Jar.}$$

*Transmitting Apparatus in Signal House.*—This consisted of a Motor Buzzer Set comprising a Service 80-volt motor fitted with a 220-volt wheel. The 220-volt supply was obtained from a Motor Generator Set, lent by "Vernon" and installed in the after Cross Passage Field

regulators and Starter were mounted on a board outside the cabinet and within reach of the operator. Leads from the motor generator set were run up the after dynamo ventilation trunk.

*Primary and Mutual.*—This was similar to the primary used on the Motor Buzzer Set in the Blue Fleet Office.

*Aerial Coils.*—A Mark I.\* Aerial Coil and a large former-wound coil of Patt. 611 wire were used. Two coils were required to obtain "W" wave on the rather small aerial available. A hand operating key was fitted in the Silent Cabinet, and a lead of concentric cable run from this key into the signal house: the inner core was connected to the bottom of the mutual coil, and the outer core was connected to the lead casing of the cable, the lead casing itself being well earthed inside and outside the cabinet. A Morse key condenser was fitted across the contacts of the hand operating key.

*Receiving Apparatus.*—Service "C" type and potentiometer.

*Third Receiving Set.*—This was used for receiving "X" Wave, and also for interception on Emergency and Destroyer Waves, &c., of both Red and Blue Fleets.

*Aerial.*—Single four-fold triced up to Starboard Main W/T Yard-arm, the lower end being secured to a boat hook stay lashed to the Starboard after corner of the Signal Bridge.

The Feeder, connected to the foot of the aerial, was led to a Bradfield Insulator fitted in a similar manner to that used in the Red Fleet Office.

*Receiving Apparatus.*—This was similar to the Service "B" Type Receiving Set, except that the Secondary winding was directly coupled to the Primary winding. No Rejector was fitted, but this Set proved to be sufficiently selective for the purposes for which it was required.

#### GENERAL REMARKS.

No attempt was made to receive if transmitting on either Red or Blue Fleet Aerials; Aerials were generally earthed temporarily whilst transmission was taking place; in the case of the Red or Blue Fleet Offices, by earthing at the Breakdown Fuze, and in the case of the Third Aerial by means of a change-over switch.

It sometimes happened that when transmitting in the Red Fleet Office, no previous warning was given to the Operators keeping watch on Blue Fleet and Admiralty Aerials respectively, no damage, however, to the Receiving Instruments resulted.

*The Mutual Effects of the Three Aerials.*—It was anticipated that the three aerials would be inter-dependent, and that any alteration made to the Receiving Circuits on one aerial would adversely affect the reception on the other two. In the case of the Red and Blue Fleet Aerials, however, no such effects were noticed, each aerial appearing to possess the usual individual characteristics of an ordinary Ship's Aerial.

The Blue Fleet Aerial, however, had a good deal of influence on the small Admiralty Aerial, when the former was adjusted for the reception of the ordinary Service Waves, and the latter for long Waves.

Earthing the Blue Fleet Aerial or adjusting it to a short Wave reduced the strength of "X" Wave Signals on the small aerial.

Insulating the Blue Aerial increased the strength of signals, and adjusting the Blue Aerial to "X" Wave still further increased the strength of signals on the small aerial.

The effect of the Admiralty Aerial on the Blue Aerial was not very marked.

Adjusting the small aerial for "X" Wave tended to weaken signals on that Wave on the larger aerials, but otherwise the small aerial did not appreciably affect the larger aerials.

Some experiments were carried out with the Red Fleet Aerial split, *i.e.*, one feeder taken to the Red and one to the Blue Office.

It was found that with this arrangement, the aerials acted for all practical purposes as independent aerials, little apparent difference being observed if one aerial was earthed, insulated, or adjusted to different Wave-Lengths.

The general conclusions drawn are that:—

- (a) Aerials of practically similar dimensions act as independent aerials.
- (b) Aerials of different values and dimensions do not affect one another providing the feeders are led away at right angles to one another, and that the aerials themselves are placed as far apart as is practicable in a Cruiser or Ship similar to "Euryalus."
- (c) Two Aerials of different values and dimensions whose feeders lie close to one another for some distance in the same plane, are affected when receiving simultaneously two widely different Wave-Lengths, the smaller aerial being affected to a greater extent than the larger one.

VIEW LOOKING FORWARD  
SHOWING HOW AERIAL FEEDERS  
ENTER THE W/T OFFICES.

H.M.S. "EURYALUS."

DIAGRAM OF 3 AERIALS USED IN MANOEUVRES.

SCALE (APPROX). 1 INCH = 40 FEET.

