ECHO SOUNDING

VIII.

In continuation of the series of descriptive articles published in the *Hydrographic Review* on echo-sounding appliances, we give below certain complementary information on the British Admiralty Echo-Sounders, concerning which a few notes have already appeared in Vol. V., N° 1 of the *Hydrographic Review*, page 131 and following.

On page 136 to 142 of this volume will be found a description of the *Echo-Sounding Machine (Shallow Water Type Mark II.* This apparatus is made in two patterns :- type A which comprises also a repeating transmitter, suitable for all vessels ; and type B, at a lower price, suitable more especially for cargo boats and trawlers.

On the opposite page is shown the general appearance of the apparatus :- transmitter, hydrophone and receiving gear placed on navigating bridge, in its most recent form (1929) which introduces a certain number of improvements.

Very successful tests have been made in submarines for detection of top surface echo, and the presence of vessels in the vicinity of the submarine when submerged.

The Hydrophone illustrated can be fitted in the deck of submarine and the echo point obtained clearly from the bottom of sea and the top surface of water.

ECHO SOUNDER : SHALLOW WATER TYPE MARK III.

This type is recommended for vessels which require soundings at high speed up to 250 fathoms.

Echo sounding has placed at the disposal of the chart maker a means of rapidly and correctly ascertaining the depth of the ocean, and it is almost certain that in a few years the greater depths will be employed for navigation purposes, as soundings will be shown on the chart over the 100 fathoms in sufficient detail to observe the accurate contour lines.

In many parts of the world this will be of great service to the fast vessel approaching a coast line which has a steep shelf and where, at three or four miles distance from the harbour, 200 to 400 fathoms are found.

In such case the shallow water Echo Sounder is not adequate, and it is possible by the variation of the rate of emission of sound from the transmitter to give an extended reading of depth. Thus in the shallow water type, the time interval is fixed at 1/3rd of a second, which gives a maximum depth of 130 fathoms ; this enables the navigator to pick up the 100 fathom line.

In the case of depths being required up to 250 fathoms, the time interval

can be increased to 2/3rds of a second, and the shallow water type is converted to read up to 250 fathom line.

The blow of the transmitter is increased in strength by using a stronger spring, and a sufficiently good echo obtained to take readings at the greater depth whilst running at full speed.

This type is now supplied and will be known as *Shallow Water Mark III.* The receiving gear is the same as the *Mark II,* and the usual form of Hydrophone is used with a transmitter of greater power. The price of the complete set of shallow water apparatus, receiving gear, *Mark III,* 100 *lbs* transmitter and inboard hydrophone, is £325 (Three hundred and twenty-five pounds sterling).

SHALLOW WATER TYPE MARK IV.

This type is recommended for vessels which require soundings at high speeds up to 500 *fathoms.*

In the case of fast vessels requiring depths of 400 fathoms, the use of the Echo Sounder, for accurate work, can be improved by the combination of the shallow water receiver with the deep water transmitter; this consists of the pneumatic hammer which is operated by a 100 *lbs* pressure once every second, as shown on illustration. A small air compressor is provided to obtain the pressure, and the blow is transmitted through water chambers between the diaphragm and the skin of the ship, so that the sound wave produced is nearly damped and gives remarkably accurate and positive readings up to and over 400 fathoms. This has been tested and proved correct in use on cable and survey ships, and the accuracy in within 0.01 %.

The price of the complete set of shallow water apparatus, receiving gear, Mark IV. 100 *lbs* transmitter, deep water type, air compressor, inboard hydrophone, is £425. (Four hundred and twenty-five pounds sterling).

Further information concerning the installation, method of working and upkeep of these instruments is given in a special booklet published by the makers:- Messrs. Henry Hughes & Son, Ltd., 59, Fenchurch Street, London, E. C. 3.