THE PORTUGUESE SURVEYING VESSEL «D. JOÃO DE CASTRO».

(Information extracted from "*Anais do Club Militar Naval*" - Sept.-Oct. 1941).

Among the new constructions of the *Arsenal do Alfeite* is the new Portuguese Surveying Vessel "*D. Joao do Castro*" of which a photograph is reproduced on the opposite page. The following are some of the principal characteristics :—

Length between perpendiculars	63.00	Meters	(192 ft)
Total length	66.90	»	(201 ft)
Width of frame	10.00	»	(30' 6")
Depth of hold	5.25	»	(16")
Mean draft	2.90	»	(8' 10")
Light displacement	772	metric tons	(760 tons)
Normal displacement (light)	957	»	(946 tons)
Full load displacement	1100.	tons.	(1080 tons)

2 oil burning water-tube boilers; two reciprocating engines, triple expansion of 700 I.H.P. capable of 15% overload.

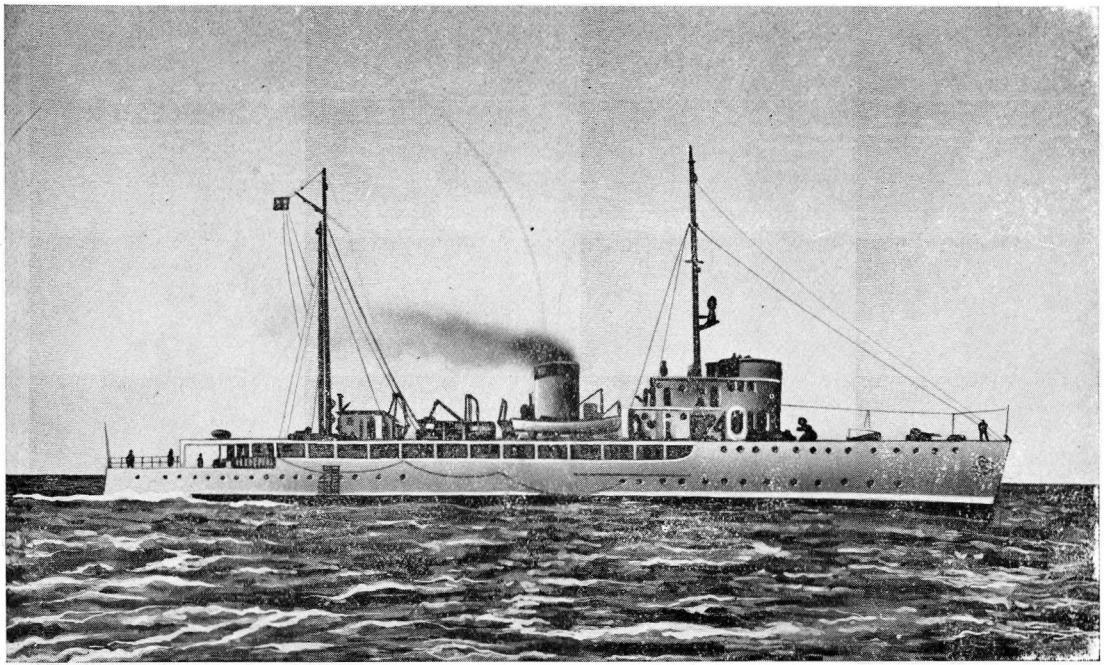
Fuel supply: 220 tons; maximum speed 12 to 13 knots; steaming radius: 5,000 miles at 10 knots.

The vessel fitted with a 60 cm. (24") projector and carries one airplane.

Quarters are provided for the captain, the second in command, 8 officers, 10 petty officers and 48 men.

The construction of the surveying vessel was begun by the Arsenal do Alfeite on 3 May 1938, the same day as the official opening of said dockyard. The launching ceremony took place on the open sea the evening of 22 April, 1940, and was presided by the Chief of the State. The first trials were run off on 20 December 1940. The building therefore took only one and one half years on the slip. The cost of the vessel amounted to about 17,570,000 milreis.

In view of the special service for which the vessel is designed, she is equipped with a large draughting room, a dark room and a laboratory. Owing to the possibility of the vessel being employed on hydrographic service in tropical waters, the type of high superstructure was chosen with an upper deck, to provide better conditions of habitability in those climates.



Portuguese Surveying Ship "D. João de Castro".


NAVIO
HIDROGRAFICO
D. JOÃO
DE CASTRO


COM DEVS
DA NAÇÃO
XXII-IV
A BEM
MCMXL
PRIMEIRO NAVIO
CONSTRVIDO NO
ARSENAL DO
ALFEITE

The spar-deck serves to carry the ship's boats and also as the platform for the airplane designed for hydrographic surveys.

The hull is constructed on the tranverse system with frames spaced 585 mm. (23").

The vessel has a continuous bridge, a spar-deck and a deck-house which is interrupted only over the engine and boiler spaces. The forecastle extends for a distance of about one third of the length of the ship and is prolonged by a superstructure of less width. It is roofed over by an upper deck which is prolonged in the form of a spar-deck, which serves to carry the whale-boats and as a platform for the airplane used for photogrametric surveys.

The hull of the vessel, built on the transversal system, is fitted with a double-bottom extending almost throughout the entire length of the ship and used as tanks for the feed-water and the fuel-oil for the Diesel engine.

The fuel-tanks are located on each side and are separated by longitudinal bulkheads in the engine and boiler spaces. The vessel is fitted with 7 transverse watertight bulkheads for the compartmentation.

The captain's cabin and the officers mess room are in the deck house on the poop; the cabins of the other officers are on the upper bridge, also on the poop. The petty-officers are quartered on the upper deck just forward of the boiler space and the crew is quartered in the superstructure and on the spar-deck forward. Consideration was given to the possibility of a mixed crew being used in the colonies in the tropics and consequently two complete and separate crew spaces were provided for the Europeans and the natives.

The spar-deck and the deck-house are roofed with teak-wood of 50 mm. (2") thickness. The covering of the quarters and the bridge is cork and linoleum. The bulkheads of the quarters are paneled with wood. Everything has been done to make the living quarters as comfortable as possible. In addition to the natural ventilation all the living spaces are provided with forced ventilation with sirocco blowers and ventilators. In the toilets, galleys and heads the ventilation is on the exhaust system.

For the hydrographic service of the vessel there is provided a spacious and well lighted draughting room, located just under the bridge. There is also a laboratory for oceanographic research and a dark room for the development of the photographs. The ship carries 6 boats, comprising 2 small boats of 8 meters (25 ft.) fitted with heavy-oil motors and 2 whale-boats also of 8 meters for surveying work, a ships motor boat of 7 meters (23 ft.) for ships use and a launch of 5 meters (17 ft.). The motor boats are fitted with the "Kitchen" rudder the use of which permits the direction to be changed.

The mainmast is fitted with a tubular cargo boom operated by a steam

windlass for use in hoisting the airplane on to the upper deck and for manoevering it into position.

The rudder is of the Gertz type especially designed to obtain a prompt response of the vessel with a minimum of resistance to the movement of the ship.

The servo-motor for the rudder is of the Brown type, operated by a hydraulic telemotor and equipped with emergency hand-gear.

The building material was dimensioned in such a manner as to obtain the necessary structural strength without induly increasing the weight. The shape of the keel was especially worked out to obtain the maximum speed with the greatest economy, and was tested in the experimental basin for naval architecture research at Rome. The results obtained in the trials at sea are in complete agreement with these designs since a speed of 14 knots was obtained with about 1200 I.H.P.

The propulsive machinery consists of two, triple-expansion steam engines, built by the firm of Mckie & Baxter of Paisley. Each engine furnishes 700 H.P. at normal speed of 230 r.p.m. The diameter of the cylinders is 273 mm. (10") H.P., 470 mm. (19") I.P. and 762 mm. (28") for the L.P. cylinders with stroke of 457 mm. (17").

The engines are of the enclosed type. The slide valves for the high and intermediate pressure cylinders are cylindrical and are hollow for the L.P. cylinders. The thrust blocks are of the Mitchel type. The water-tube boilers were built by the firm of Samuel White and Co. and have a total heating surface of 342.6 m2 (2570 sq. ft.). The super-heaters have a heating surface of 91.4 m2 (672 sq. ft.). The steam is formed at a pressure of 17.5 kg. / cm2 (24' lbs/sq.in) with a superheat of 27.7°C (62°F) or at a temperature of steam of 232.5°C.

The capacity of the fuel tank assures a steaming radius of 5,000 miles at 10 knots. The supply of water is ample; tanks are provided with a capacity of 80 tons of water and in addition there are 20 tons reserve feed water for the boilers.

The vessel is equipped with all apparatus necessary for carrying out hydrographic surveys; Lucas sounding machine, echo sound using ultrasonic waves, and also the Sperry gyroscopic compass.

On the occasion of the launching of this vessel a medal was struck off to commemorate the first launching from the Arsenal do Alfeite.