

THE BRAZILIAN DIRECTORATE OF HYDROGRAPHY AND NAVIGATION

Brief History

In the years following the discovery of Brazil in 1500, cartographic activities were practically nonexistent, and the Portuguese restricted their endeavor in this field, where so much was necessary, to the publication of a few sailing directions and general nautical instructions.

This situation lasted until the XIXth century, when through the extensive activity of a number of French hydrographers, a large part of the coast was surveyed and data obtained for the construction of charts covering almost the whole coast. Among the many expeditions, those by ROUSSIN, TARDI de MONTRAVEL, BARRAL and MOUCHEZ are the more noteworthy, especially the last, since the excellence of his work in Brazil largely contributed to MOUCHEZ' international fame.

The magnificent work of these French hydrographers inspired various Brazilian naval officers to dedicate themselves to the hydrographic calling. A name that deserves mention in this connection is that of Captain Manoel Antonio VITAL de OLIVEIRA, considered the " first " Brazilian hydrographer, and cited as an example to be followed by all hydrographers.

The endeavors of these officers and various important administrative decisions awakened a consciousness as to the importance of the kind of work they did, and of research in the fields of hydrography, beaconage and meteorology. This in turn led to the promulgation of government decrees creating the agencies responsible for the direction and organization of these activities.

The administration of lighthouses, for instance, was made the responsibility of the Port Directors, when, in 1845, these were created; before that each lighthouse had its own administration, directly under the Navy Administration. But it was not until 26 January, 1876 that the government created a *Repartição de Faróis* (Lighthouse Service), under Captain Francisco José de FREITAS.

Through the untiring efforts of a group of enthusiastic officers, on 2 February, 1876, the government created the *Repartição Hidrográfica* (Hydrographic Office), the first director being Commander Antonio Luiz Von HOONHOLTZ, Baron of Tefé.

In 1888 the Meteorological Office was created, under the Navy.

In 1893 the three offices were combined as the *Repartição da Carta Marítima* (Nautical Chart Office).

In 1908 the name was changed to *Superintendência de Navegação* (Bureau of Navigation), in 1923 to *Diretoria de Navegação* (Directorate of

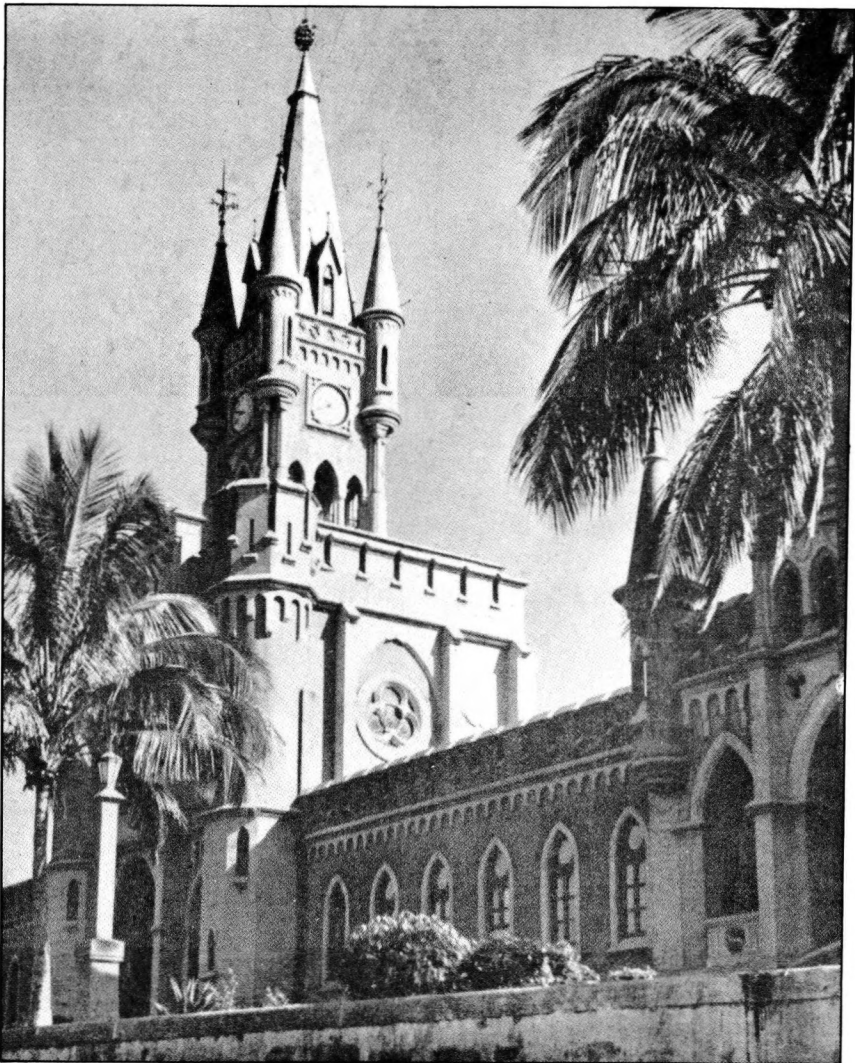


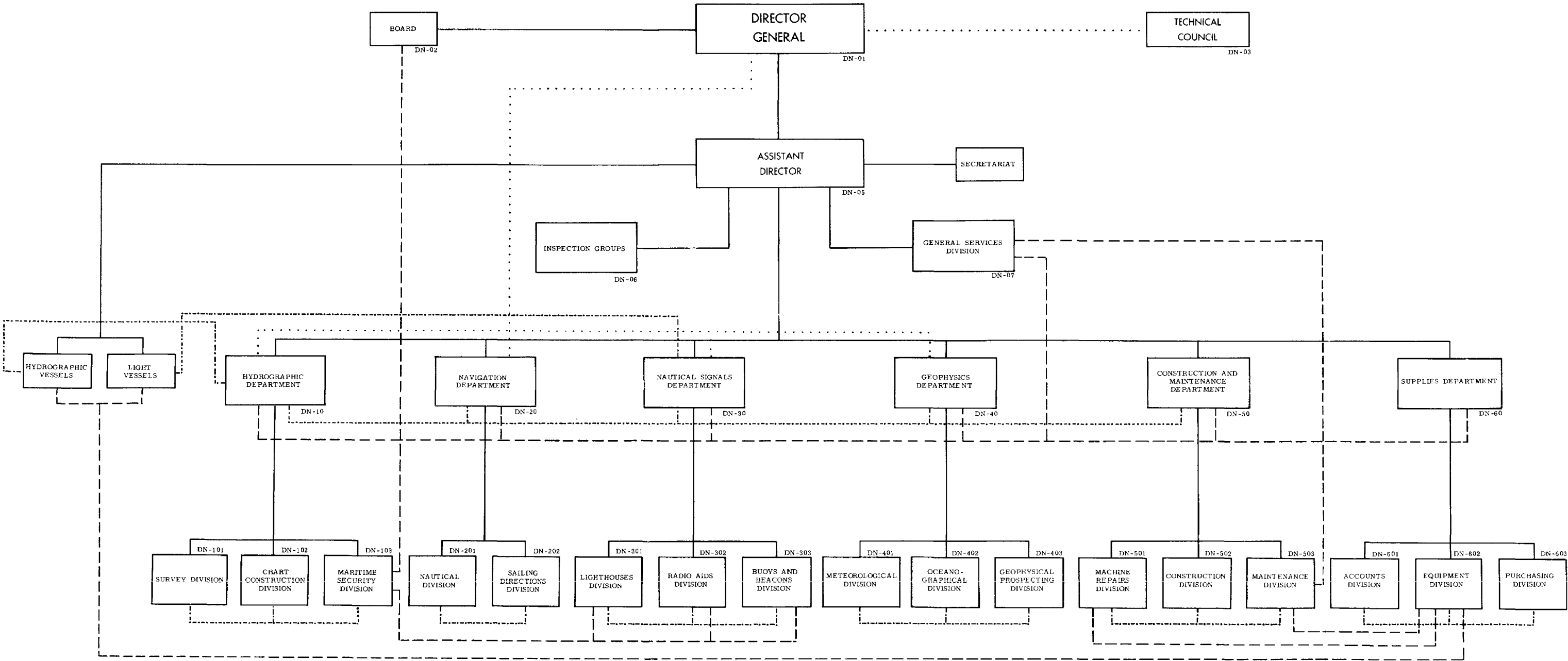
Figure 1. — Directorate of Hydrography and Navigation building

Navigation), a name which, in 1946, was changed to *Diretoria de Hidrografia e Navegação* (Directorate of Hydrography and Navigation). From 1923 the responsibilities of the Office were hydrography, lighthouses and buoys, and navigation.

In the field of hydrography proper, the year 1929 stands out as a very important one, since new endeavors led to the creation of hydrography and navigation as a special qualification for officers, equal in standing to gunnery, engineering and so on. In this connection much is due to Admiral GRAÇA ARANHA, supported by a team of dedicated officers, who did their best to organize our hydrographic activity. GRAÇA ARANHA also inaugurated the first radiobeacon in Brazil, at Sao Tomé, State of Rio de Janeiro.

The second world war naturally interrupted regular hydrographic work, but this was resumed as soon as the war ended.

HYDROGRAPHY AND NAVIGATION DIRECTION
ORGANIGRAM



Present Organization

The *Diretoria de Hidrografia e Navegação* is the agency of the naval establishment responsible for hydrography, navigation, oceanography, marine meteorology, lighthouses and beacons (at sea, in rivers and in lakes).

It is the only government agency qualified for marine cartography, and its responsibilities include the building, maintenance, operation and repair of all lighthouses, buoys and beacons, as well as the publication of all information of nautical interest.

The technical responsibilities of the Directorate are divided among three *Departamentos* (Sections) : Hydrography, Navigation, Geophysics, with the following subsections or divisions : Survey, Charts, Safety, Navigation, Nautical Instruments, Meteorology, Oceanography and Geophysics.

All matters pertaining to lighthouses and beaconage come under a fourth section : Nautical Signalling.

Charts made by the *Diretoria* are designed according to our chart specifications (*Especificação sobre Cartas*), embodying all the technical resolutions recommended by the Vth International Conference, 1947.

All details pertaining to the designing of our charts, from the first drawing to offset printing, including work on zinc sheets, pantogravure, glass or plastic, the preparation of the original, photography, etc., are explained in *Especificações sobre Cartas*.

Up to the present, the *Diretoria* has restricted its activities to the Brazilian coast, and its charts are either entirely the result of new surveys, or compiled from old Brazilian or French surveys.

Besides its nautical charts, the *Diretoria* prepares, publishes and distributes many other publications of interest to navigators, such as Sailing Directions for the Brazilian coast, a List of Lights, Radio Aids to Navigation, a Nautical Almanac, Nautical Tables, etc.

Charts and publications are kept up to date through Notices to Mariners, broadcast every day by a network of radio stations, and by pamphlets printed fortnightly. Notices to Mariners are regularly sent to corresponding foreign agencies.

Our charts are offered to all navigators in both the Navy and Merchant Marine.

Following international practice, charts and documents are exchanged regularly with all hydrographic services throughout the world.

The organization is shown in diagram form.

Training Methods

Until 1959, the *Diretoria de Hidrografia e Navegação* restricted its activities, in the field of training and education, to the formation of officers by a regular eleven-month period of instruction, open to first lieutenants chosen by the Naval Bureau of Personnel. Officers from other Latin American countries as Colombia, Venezuela, Paraguay and occasionally some civilians, attend this course of instruction, which covers magnetic compasses, aids to navigation, astronomy, cartography, echo sounders, photogrammetry, geodesy, hydrography, terrestrial magnetism, tides, me-

teorology, navigation, oceanography and topography. After these eleven months of training a small but complete survey, usually of a small port, gives an opportunity for practical field work.

In 1960 the Diretoria is giving regular instruction for the first time to sailors, from chief petty officers down, with the aim of forming a corps of specialists in hydrography.



Figure 2. — Hydrographic Vessel *Sirius*

Ships

The Diretoria has 5 hydrographic ships, 1 oceanographic ship, 1 light-house tender, 8 buoy tenders and 13 hydrographic motorboats.

(1) *NHis Sirius* and *Canopus*. Built in Japan by Ishikawajima Heavy Industries Co. Ltd., Tokyo, these ships were received on 17 January 1958 and 21 February 1958.

The main characteristics are :

Displacement	1 875 t
Overall length	78.70 m
Width	12.00 m
Depth	3,70 m
Maximum speed	15 knots
Cruising speed	11 knots
Autonomy	8 000 miles at 11 knots
Propulsion	2 1350-HP Diesel engines.

Each ship carries three hydrographic motorboats, one landing craft, 1 helicopter and 2 jeeps, and the following equipment :

- 5 Kelvin Hughes MS 26F echo sounders (2 aboard and 3 in boats)
- 1 Kelvin Hughes MS 26G for navigation;
- 1 Kelvin Hughes MS 26H for oceanography;
- 1 Raydist model DM;
- 2 electrical wire sounding machines;
- 3 mechanical wire sounding machines;
- Radar;
- Loran;
- Oceanographic laboratory.

The crew consists of 16 officers and 84 ratings.

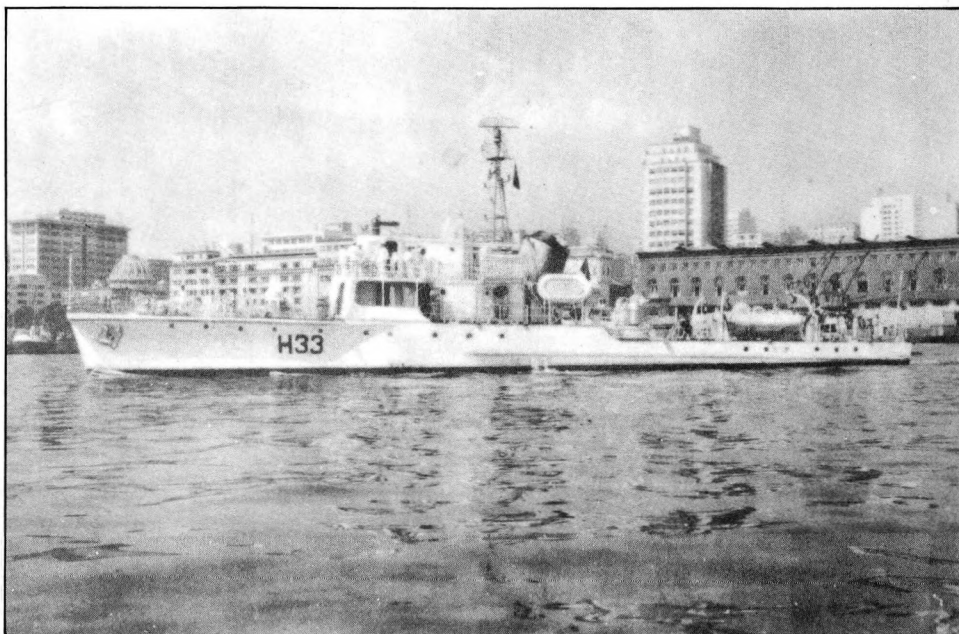


Figure 3. — Hydrographic Vessel *Taurus*

(2) *NHis. Argus, Taurus, Orion*. Built by Rio de Janeiro Navy Yard, delivered on 29 January 1959, 23 April 1959 and 11 June 1959.

The main characteristics are :

Displacement	343 t
Overall length	44.67 m
Width	6.50 m
Draft (maximum)	2.80
Maximum speed	15 knots
Autonomy	4 500 miles at 12 knots
Propulsion	2 600-HP Diesel engines.

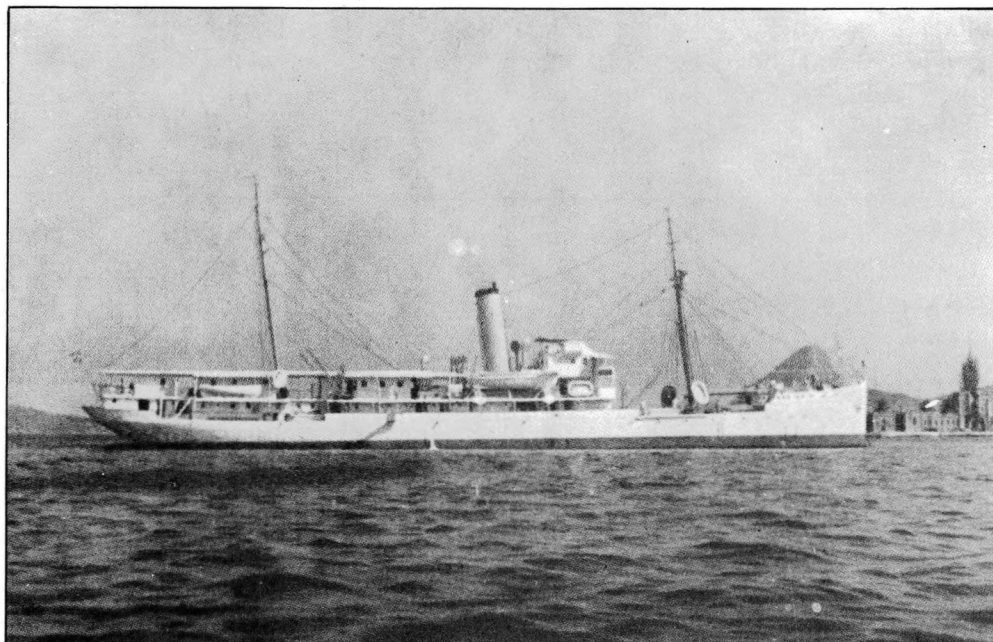


Figure 4. — Lighthouse Supply Ship

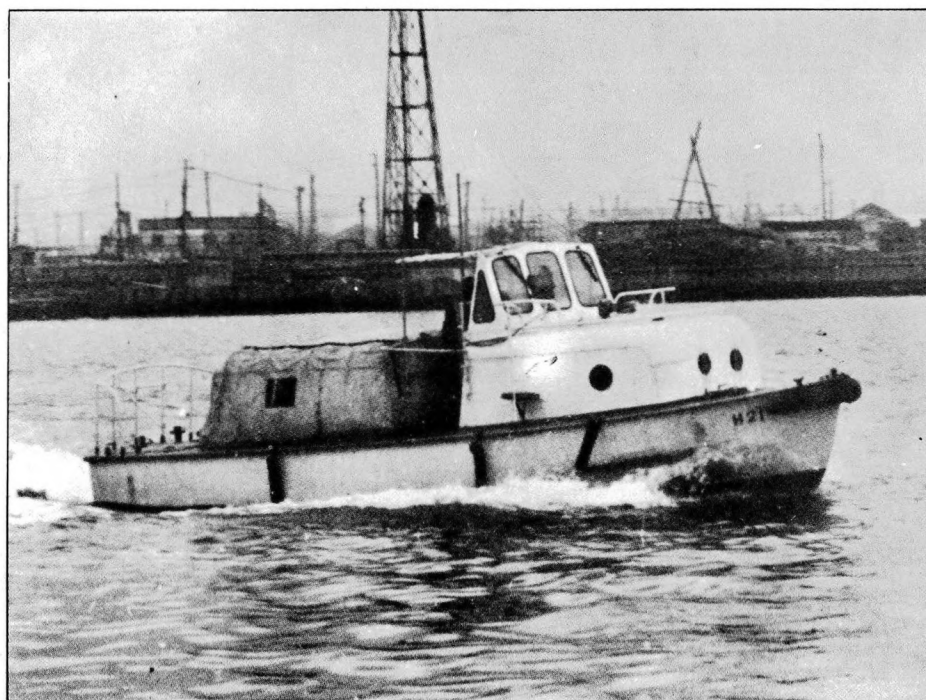


Figure 5. — Hydrographic launch attached to the vessel *Sirius*

They have two sonic sounders (Brazilian-made), model ET/SQN-1, range 1 000 metres; 1 Raydist ER; 1 electric sounding machine; 1 sweeping equipment; Raytheon radar; a Minor gyrocompass, MR-E-VIII, model O; direction finder and telemeter (4 000-m range).

The crew consists of 5 officers and 28 ratings.

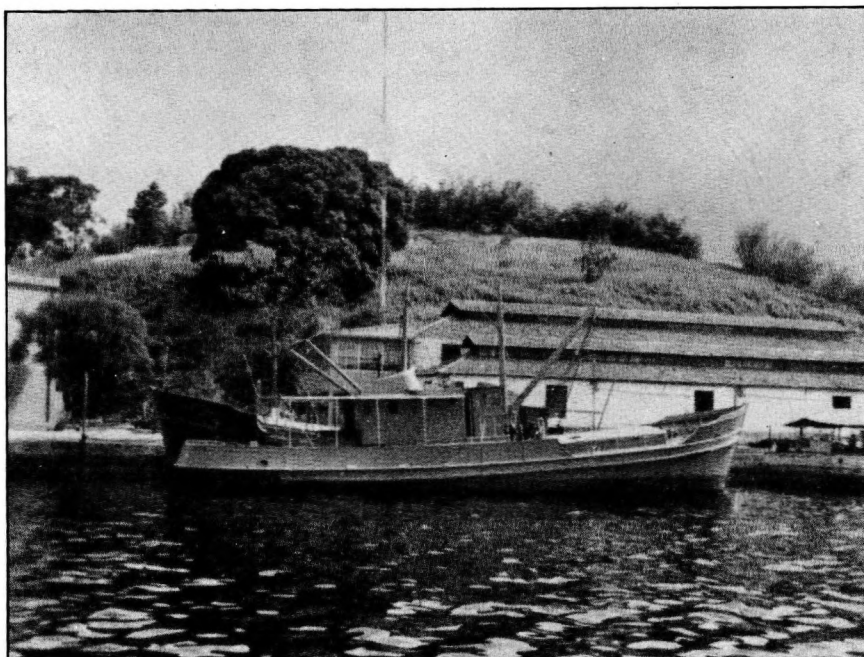


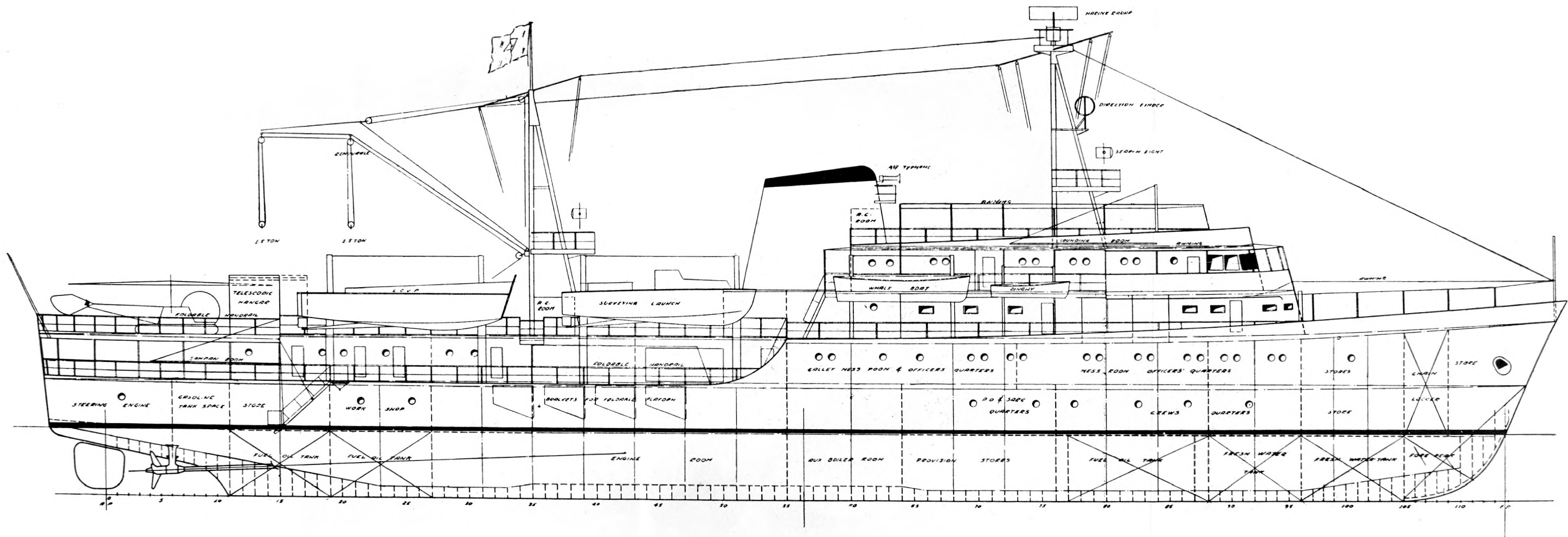
Figure 6. — Buoy-laying vessel

(3) Oceanographic ship *Almirante Saldanha*. Adapted for oceanographic work, this vessel has one laboratory for the chemical analysis of salinity, oxygen, pH, nitrates, nitrites, phosphates, etc; one TSK wire sounding machine with 5 000 metres of wire, plankton nets, bottom samplers, bathythermographs, etc. It worked with the International Geophysical Year organization, covering, with some 200 stations down to 3 000 metres, three great ocean areas :

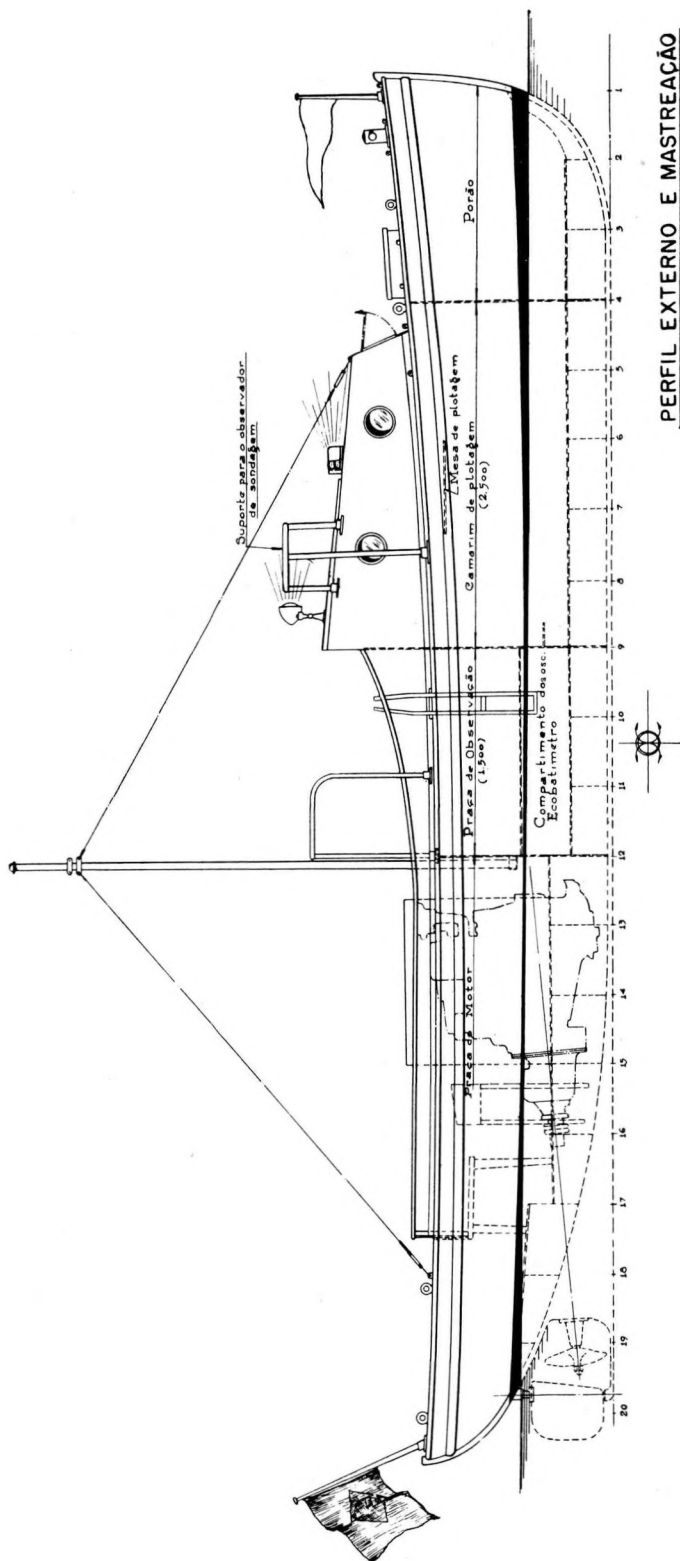
- (a) Cabo Frio, Trinidad, Salvador;
- (b) From Cabo Frio to 35° S;
- (c) The mouth of the Amazon.

(4) Lighthouse tender *José Bonifácio*. An old hydrographic ship, recently converted into a lighthouse tender; it will be employed in the inspection and maintenance of lighthouses and buoys.

(5) Buoy tenders. Small wooden craft, specially built for buoy maintenance.



Hors texte 7. — Plan of hydrographic vessel of Sirius class



PERFIL EXTERNO E MASTREACÇÃO

Figure 8. — Hydrographic launch in profile

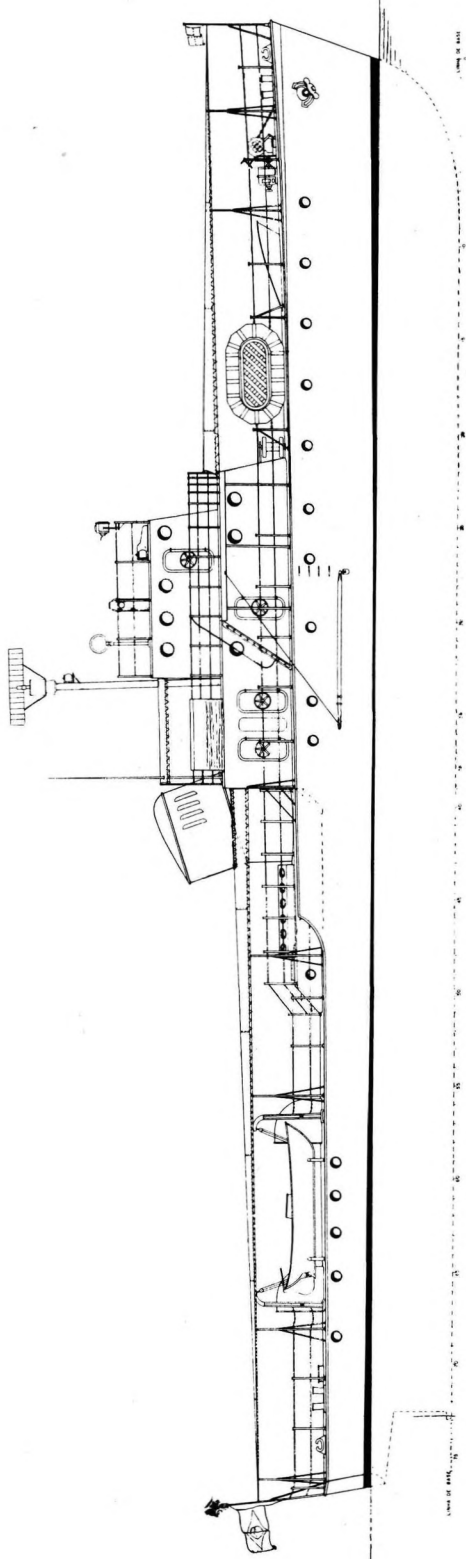


Figure 9. — Profile of hydrographic vessel of *Argus* class

Selling Agencies

All charts and publications from the Diretoria de Hidrografia e Navegação may be bought at the following agencies :

N.V. Observator
Westzeeduk 52
ROTTERDAM - W (Netherlands)

Editora Paulo de Azevedo Ltda.
Rua do Ouvidor, 166
RIO de JANEIRO

Antonio Carlos Pinto
Rua Major Facundo, 286 - 2º andar,
FORTALEZA

Klaus & Filhos Ltda.
Rua do Progresso, 45
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J. Pedrosa & Cia. Ltda.
Rua Conselheiro Saraiva, 4 - 3º andar
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Editora Paulo de Azevedo Ltda.
Rua Líbero Badaró, 292,
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Sétimo José Luizelli,
Rua Marechal Floriano, 505,
PORTO ALEGRE

Casa Minerva,
Praça Visconde de Mauá, 46
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Medal in commemoration of Hydrographic Surveying Centenary 1857-1957

