

ARGENTINE OCEANOGRAPHIC VESSEL

A.R.A. GENERAL SAN MARTIN

Extracted and translated from : Publication *Expedicion Argentina al Mar de Weddell* (December 1954 to January 1955), by Commander Luis R.A. CAPURRO

Main characteristics :

The A.R.A. *General San Martin* was built in 1954, in the G. Weser naval shipyard, Seebeck Werft, Bremenhaven, Germany, as an ice-breaker, and is used for oceanographic purposes.

It was built according to specifications laid down by the Navy Department and German Lloyd.

Its main characteristics are as follows :

Overall length	84.70 metres
Length at water-line	76.95 »
Length between perpendiculars	75.00 »
Maximum Beam	19.00 »
Beam at water-line	18.60 »
Height as designed to main deck	9.85 »
Height to middle deck	7.50 »
Normal draught	6.50 »
Normal displacement	4,854 tons
Speed	16 knots

Propulsion is of the Diesel-electric type, with twin screws on shafts directly actuated by direct-current electric motors, each powered at 3150 kw. and installed in individual watertight compartments.

The generating plant for powering the motors consists of four Diesel-powered generators, developing 1,870 HP at 270 RPM, for current operation purposes, and 2,040 HP at 300 RPM for maximum power, installed by pairs in two watertight compartments. The powering of the propulsion-motors is controlled by means of the Ward Leonard system.

Resistance of the hull is ensured through the use of ship steel, welded throughout. The metal-sheeting is of highly resistant steel for withstanding shocks at low temperatures. The structure and shape of the sides are such as to enable the ship to withstand the pressure of ice, and to be raised in case it is ice-locked. The outer skin is smooth so that it presents no obstacle to the ice. All openings in the skin have been kept at a minimum.

The thickness of the frames throughout the ship's length is 800 mm. Intermediate frames have been installed which reduce the general frame-thickness to 400 mm. : these extend from the crown of the double-bottom to the middle-deck.

The outer sheeting of the ship has been strongly reinforced, and the thickness at the water-line is as follows :

middle at centre length	27 mm.
one-quarter of length forward	30 »
one-quarter of length aft	28 »

The stem is massive and of cast steel; it is of sufficient strength to break the ice, and is inclined 26° with respect to the base line. It is sufficiently reinforced to ensure proper distribution of the forces acting against it.

The stern-post consists of soldered metal-sheeting with steel castings to support the rudder. Above the latter, at the load-line, is a guard for the rudder. The rudder is a double sheet of metal of extremely robust construction, and can be unshipped by means of the ship's own gear.

The plans show the ship's two flush-decks and large quarter-deck with a platform for storage of planes and helicopters. The double-bottom runs from stem to stern, at a height of 1.67 m.

Below the deck there are seven main transversal bulkheads and two watertight longitudinal bulkheads. These form compartments, tanks, and two cargo holds.

The total capacity of the fuel tanks gives the ship a cruising range of 16 400 miles at a speed of 16 knots.

Below the middle deck there are two waterballast tanks of approximately 160 tons each. Water may be transferred from one side of the ship to the other, by means of two axial pumps operating at variable speed, in ninety seconds, enabling a heel of 10° to be obtained.

Fore and aft are two 120-ton tanks for trimming the ship, by means of a two-stroke axial force-pump.

Total variation of the load-line is 1.50 m. at the stern, in 3 1/4 minutes.

The ship is equipped with the following anchors :

- 2 bowers weighing 3000 kg. each.
- 2 spare anchors weighing 3000 kg. each.
- 1 stern-anchor weighing 1100 kg.
- 1 deep-sea anchor weighing 720 kg.
- 4 ice-anchors weighing 150 kg.

Each bower is equipped with 300 m. of chain (12 lengths) of 47 mm. diameter.

An electrical winch has been installed for anchoring at greater depths; it can heave in a 728 kg. anchor and 300 fathoms of steel cable 31.8 mm. in diameter.

An automatic towing winch is located aft, and is electrically operated. The machinery is designed for a tractive force of 65 tons. When hauling in cable with 40/20 tons traction, the speed is 9-18 m. per min. Total capacity of the drum is 390 m. of cable.

Two 12-ton rotary cranes are located on the quarter-deck for handling the planes and boats.

As noted above, propulsion is by Diesel-electric direct-current power. The four Diesel generating units are located in two separate watertight compartments, and the power is transmitted directly to the two motors coupled with the shafts.

Propulsion is controlled at will from any one of the control stations, i.e. the main generating-unit compartments, the wheel-house, or the crow's nest.

The Diesel motors of the main generating units are of M.A.N. construction, single-acting, four-stroke, with overfeed, and of the G9V 40/60 m.A. type Normal power is 1870 H.P. at 27 RPM, and maximum power 2,040 H.P. at 300 RPM. Each motor's exhaust is equipped with a La Mont boiler supplying the steam required for heating purposes.

The auxiliary electric plant consists of four 200-kw., 230-volt D.C. Diesel generators. The motors are of M.A.N. single-acting, four-stroke construction, of the 305 H.P., 500 RPM G8V 38 type.

The propellers are of cast steel, consisting of four detachable blades 4 m. in diameter.

The vessel is equipped with two 10-cm. radar sets, and with two 500-fathom echo-sounding machines, in addition to two 4000-fathom echo-sounders.

For oceanographical and weather research, the ship is equipped with an oceanographical laboratory, a meteorological room, a radiosonde compartment, and a photographic laboratory. For bottom-sampling at greater depths, the ship has two A.E.C. winches with 6,000 metres of 1/2" cable. All parts of the ship are equipped with appropriate modern instruments.

CUBIERTAS SUPERIORES

CARACTERISTICAS

ESLORA TOTAL	84,70 m
ESLORA ENTRE PERPENDICULARES	71,00 m
MANBA MOLDEADA	8,60 m
CALADO DE DISEÑO EN SECCION MAESTRA	6,50 m

ARA. >GENERAL SAN MARTIN<

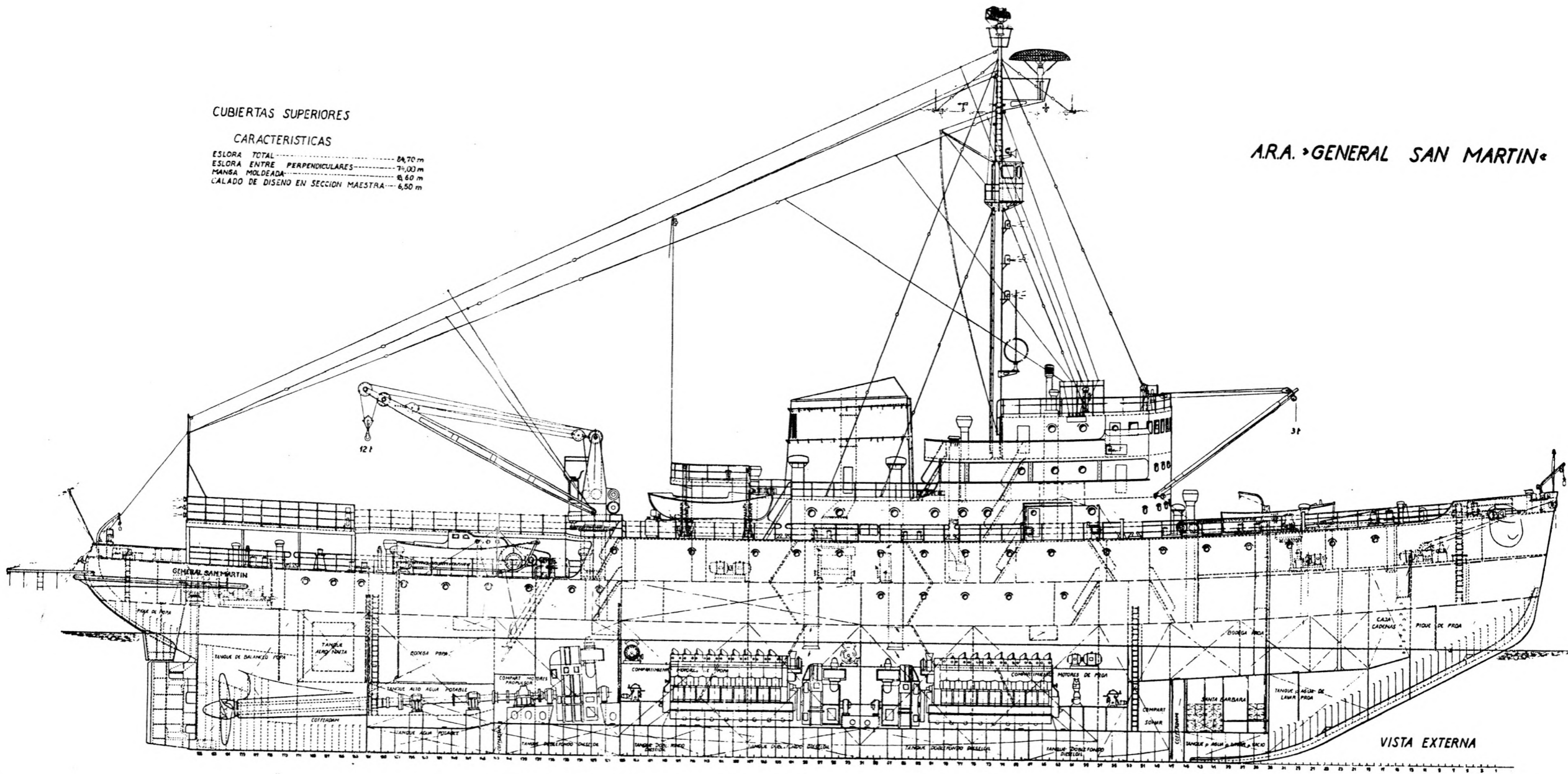
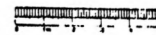
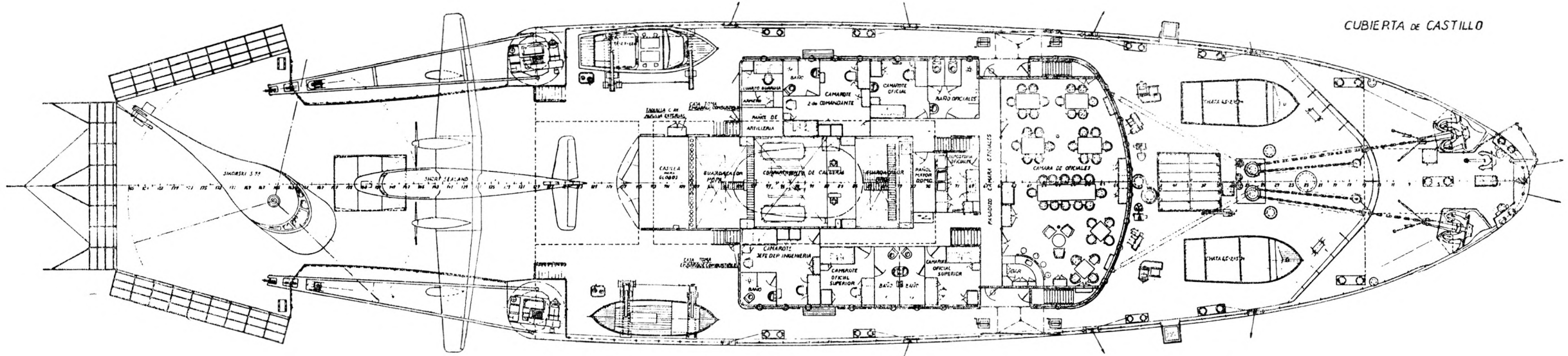


Fig.1



CUBIERTA DE CASTILLO



CUBIERTA PRINCIPAL

